CHAPTER 54

LIST OF EFFECTIVE TEMPORARY REVISIONS

FOLLOWING IS A COMPLETE LISTING OF ALL ACTIVE TEMPORARY REVISIONS (TR'S). TR'S NOT LISTED SHOULD BE REMOVED. THE ATA NUMBER, CONFIG CODE AND PAGE NUMBER IDENTIFIES THE PAGE PRECEDING THE TR.

TR NUMBER	ATA NUMBER	CONFIG CODE	PAGE NUMBER	TR DATE

NONE

CHAPTER 54

NACELLES/PYLONS

LIST OF EFFECTIVE PAGES

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CHAPTER 54

NACELLES/PYLONS

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NACELLES/PYLONS - DESCRIPTION AND OPERATION

1. General

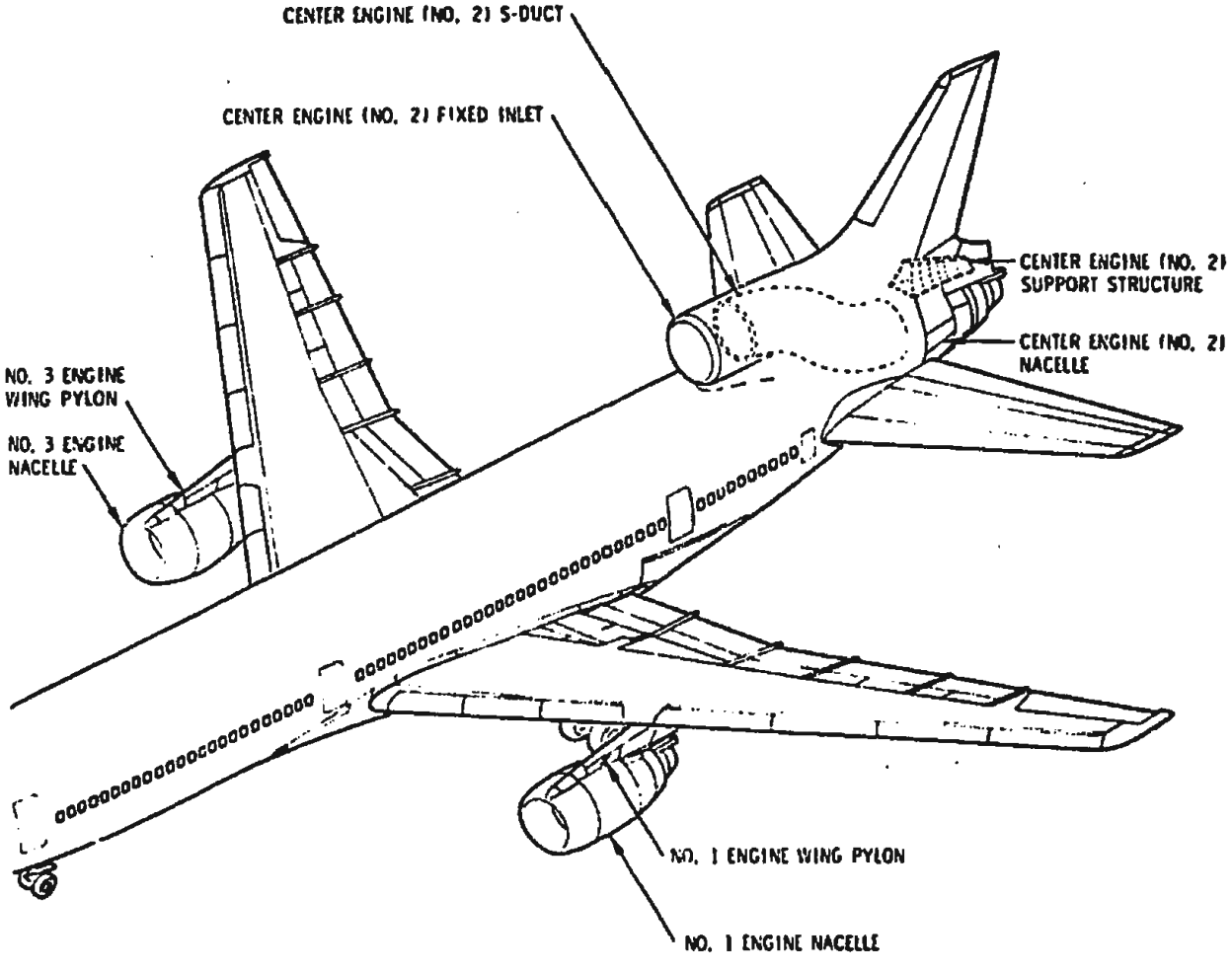
The three engine nacelles (Ref. Fig. 1) are located on the left and right wings, and in the aft fuselage. The engine No. 2 (center engine) is mounted on the center engine support structure. The wing engines (No. 1 and No. 3) are pylon-mounted. The pylons support the engines and house the fuel, electrical, hydraulic, heating, ice protection, pylon vent ducting, and engine controls.

The wing pylon (Ref. Fig. 2) consists of a main frame, leading and trailing edges, attach fittings, and fairings. The main frame is the primary structure forward of the front pylon-to-wing attach fittings and extends forward to pylon station (PS) 99.60. The main frame also includes the drag strut fitting which extends aft to the wing attach fitting at PS 358.30.

The wing engine nacelle structure consists of a nose cowling; a hinged cowl support structure; and a left and right hinged cowling. The hinged cowling panels are hinged for access to the engine accessory section.

The center engine nacelle consists of the center engine support structure; the left and right upper hinged cowling; the left and right lower hinged cowling; and the left and right fixed cowling.

The No. 2 engine air supply is provided through the fixed air inlet duct and the S-duct. The fixed air inlet duct includes the nose cowling which is heated to prevent icing. The S-duct is attached to the fixed inlet duct and to the engine face. The S-duct is segmented to facilitate removal and installation.


CENTER ENGINE (NO. 2) S-DUCT
CENTER ENGINE (NO. 2) FIXED INLET
CENTER ENGINE (NO. 2) SUPPORT STRUCTURE
CENTER ENGINE (NO. 2) NACELLE
NO. 3 ENGINE WING PYLON
NO. 3 ENGINE NACELLE
NO. 1 ENGINE WING PYLON
NO. 1 ENGINE NACELLE

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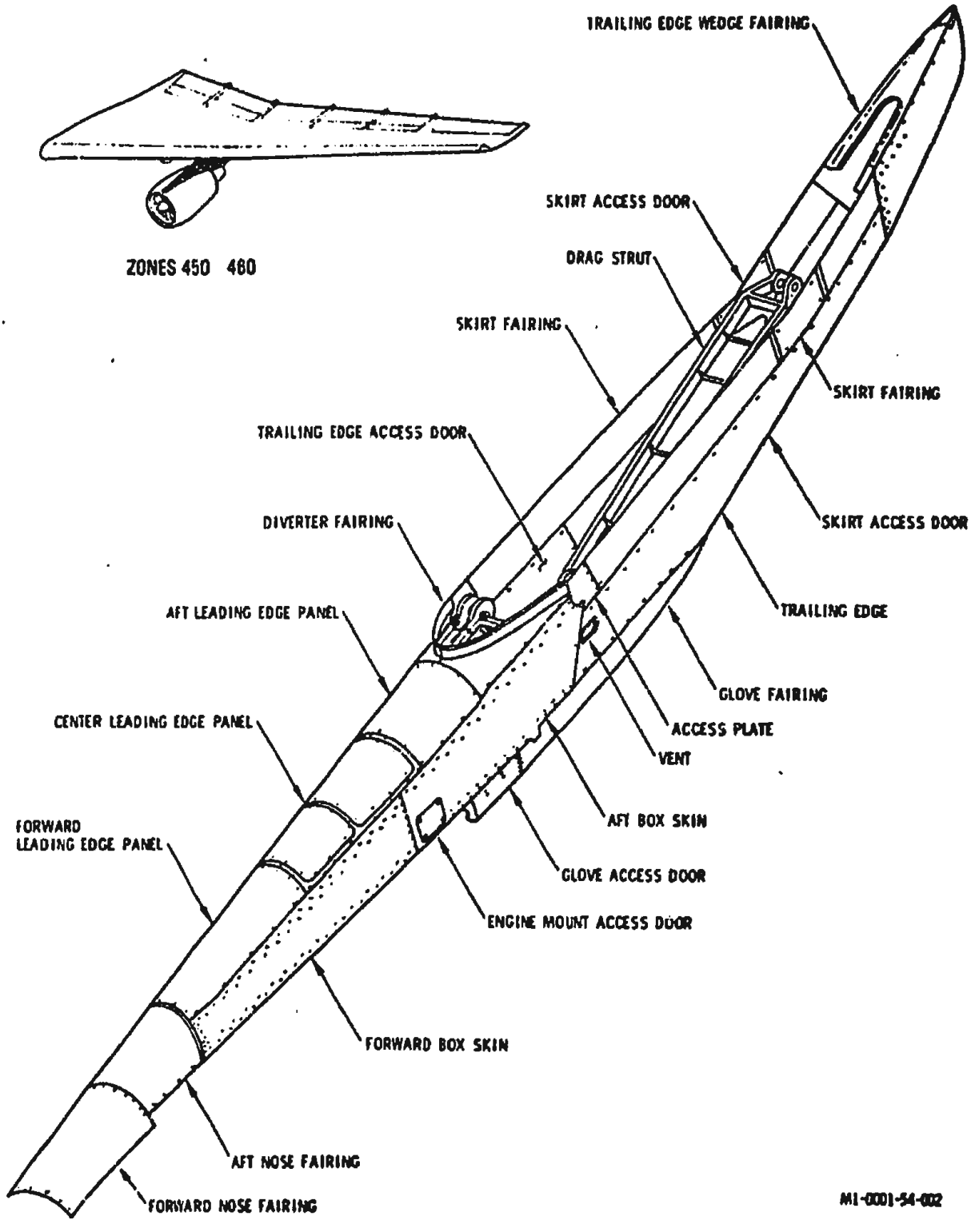
R
R

Nacelles and Pylons
Figure 1

EFFECTIVITY: ALL

001B



R
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Wing Pylon
Figure 2

EFFECTIVITY: ALL

001B

PYLON/WING ATTACH BOLTS - REMOVAL AND INSTALLATION WITH ENGINE INSTALLED

1. General

The pylon/wing attach bolts secure the No. 1 and No. 3 engine pylon in position on the wing. These bolts can be removed and replaced, as required, with engine attached.

R NOTE: Brass washers shown in Figure 404 need not be replaced if
R they are being extruded from their normal position.
R Deterioration of brass washer is normal, however, if
R washer wears thru and bolt head or steel washer is
R scrubbing on fitting, washer should be replaced at engine
R change or a prior convenience opportunity.

2. Equipment and Materials

Landing Gear Downlock Safety Pins, PN 1302300-101

Chocks, manufactured by Brooks and Perkins, Inc., or equivalent

Static ground cable, common to all airport facilities

Towing Lockout pin, PN 1302788-101, or equivalent

Hydraulic Wing Jacks 100-ton (90,702-Kg) capacity, Model 792B Malabar, Mfg. Co., or equivalent

Hydraulic Fuselage Jack 30-ton (27,210-Kg) capacity, Model 733B, Malabar Mfg. Co., or equivalent

Hydraulic Wing Jacks with load gauges 25-ton (22,725-Kg) capacity, Model 7120A, Malabar Mfg. Co., or equivalent

Hydraulic Wing Jacks with load gauges 12-ton (10,896-Kg) capacity, Model 713, Malabar Mfg. Co., or equivalent

Aircraft Jacking Pad adapter Set, PN STC 90517-17, Spec Tool Co., or equivalent

MLG Shock Strut Lock Assy, PN 1504972-923-MST, or equivalent

NLG Shock Strut Lock Assy, PN B708-101, or equivalent

RAT, Ground Safety Bar, PN 1304565

Wing Engine Sling, PN 673290, or equivalent

Overhead crane 10-ton (9,090-Kg) capacity and 30-foot-high lift

Multipurpose Engine Stand, PN CP30000/1, Rolls-Royce Ltd., or equivalent

Engine Cowl Panel Dolly, PN B72, or equivalent

Engine Cowl Panels Sling Set, PN B674, or equivalent

Adapter Kit Hoist, PN CP30010, Rolls-Royce Ltd., or equivalent

Solvent (Cleaner) - 1,1,1,Trichloroethane (MIL-T-81533), or equivalent

Grease - Aircraft and Instrument (General Purpose), MIL-G-23827, or equivalent

Strap - Nylon cargo tie down strap, PN 952020-10-72N, or equivalent

Hydraulic Press, LCC P/N CL29D61-1, (G/ITEL 54-11-05)

Pylon Removal and Installation Tool Set, BG35, or equivalent

3. Referenced Procedures

	6-40-00	Exterior Access Doors and Panels
	6-50-00	Interior Access Doors and Panels
	7-11-00	Jacking Aircraft at Wing and Fuselage - Maintenance Practices
	8-11-00	Plumb Bob Leveling - Maintenance Practices
	9-11-00	Normal Towing Conditions - Maintenance Practices
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R R	20-51-02	Preparation for and Installation of Mechanical Fasteners
	24-41-00	External Power/Ground Service System - Maintenance Practices

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54-11-00	Bolt Refurbishment - Structural Repair Manual
54-51-56	Trailing Edge Wedge Fairing - Removal and Installation
71-00-00	Power Plant - Maintenance Practices
71-00-01	Wing-Mounted QEC Unit - Maintenance Practices
71-11-01	Left-Hand Hinge Cowl - Removal and Installation
71-11-02	Right-Hand Hinged Cowl - Removal and Installation

4. Removal/Installation

A. Procedure for Pylon Bolt Removal/Installation with Engine on Aircraft.

(1) Ground aircraft to an approved grounding lug.

(2) Provide electrical power (Ref. 24-41-00) as required.

(3) Position applicable power control lever, zone 210, in fully retarded (ground idle) position.

(4) Ensure that the thrust reverser lever is fully forward in ground idle position.

(5) Depressurize applicable (A or D) hydraulic system and tag hydraulic system panels (Ref. 29-11-00).

CAUTION: DO NOT ROTATE T-HANDLE WHEN PULLED. THE FIRE EXTINGUISHING AGENT DISCHARGE SWITCH IS EXPOSED AND ARMED WITH THE FIRE EMERGENCY ENGINE SHUTOFF CONTROL T-HANDLE HAS BEEN PULLED.

(6) On pilots overhead panel, zone 210, pull, do not rotate, applicable engine fire emergency shutoff control T-handle to close the firewall fuel and hydraulic shutoff valves (Ref. 28-24-00 and 29-11-32).

(7) Open and tag following Engine 1 or 3 circuit breakers on pilots overhead circuit breaker panel CB1, zone 210:

(a) TGT ENG 1 (F10) or 3 (F12)

(b) START IGN ENG 1 (F13) or 3 (F15)

(c) FUEL SHUTOFF ENG 1 (F16) or 3 (F18)

(d) TACH N3 ENG 1 (E10) or 3 (E12)

(e) START CONT ENG 1 (E13) or 3 (E15)

(f) FUEL FL RGLTR ENG 1 (E16) or 3 (E18)

(g) FIRE EXTINGUISHER MAIN and ALTN (C10 and C11, C14 and C15)

(h) THRUST REVERSE (H16 or H18)

(i) FUEL SHUTOFF VALVE-TANK-ENG-1 (D10)

(j) FUEL SHUTOFF VALVE-TANK-ENG-3 (D12)

(k) HYD PUMP and FIREWALL SHUTOFF VALVE CONT SYS A (L15) or SYS B (L18).

CAUTION: PARK AIRCRAFT IN LEVEL SHELTERED AREA ONLY TO AVOID WINDY CONDITIONS. DO NOT JACK AIRCRAFT IF GROSS WEIGHT EXCEEDS 340,000 POUNDS (154,195 kg). DO NOT EXCEED ALLOWABLE LOADS AT JACKING POINTS (REF. 7-11-00).

(8) Ensure main landing gear wheels are chocked and all landing gear downlock safety pins are installed.

(9) Aircraft must be placed on wing and fuselage jacks to stabilize and provide support, as necessary, for proper balance of aircraft (Ref. 7-11-00 and 10-20-00).

CAUTION: ENGINE TO STAND CLEARANCE IS EXTREMELY TIGHT. CLOSE ALIGNMENT MUST BE MAINTAINED DURING ALL OPERATIONS.

(10) Position workstands and platforms as required.

(11) Remove panels 452/462 FR, 452/462 FL, 453/463 GR, 453/463 GL, 453 DR and 463 DL, 453/463 B and 453/463 C (Ref. 12-26-02).

(12) Remove engine cowling (Ref. 71-11-01 and 71-11-02).

(13) Using overhead crane, lift engine stand (cradle) to engine and attach to engine. Attach jack pads to engine stand (Ref. Fig. 402 and 403).

NOTE: At this point, any load on overhead crane must be relieved to a cable taut condition.

B. Procedure for Pylon Bolt Removal/Installation

(1) Remove drag strut aft bolt as follows:

(a) Remove wedge assembly (Ref. 54-51-56).

(b) Support drag strut by attaching one end of a nylon cargo tie strap to the inside of pylon support assembly and the other end to the aft pylon drag strut; secure strap (Ref. Fig. 406).

CAUTION: LOAD ON JACK SHOULD NOT EXCEED 15,000 POUNDS (TOTAL OF 30,000 POUNDS FOR BOTH JACKS) AS THIS PLACES UNNECESSARY LOAD ON STRUCTURE.

(c) Apply load on both hydraulic jacks until load gauge on each jack reads 7,750 pounds (total of 15,500 pounds for both jacks).

(d) Remove aft drag strut nut and washers.

(e) Use wrench (BG35 tool set) to turn bolt enough to note ease of rotation and freedom from binding.

CAUTION: LOAD ON JACK SHOULD NOT EXCEED 15,000 POUNDS (TOTAL OF 30,000 POUNDS FOR BOTH JACKS) AS THIS PLACES UNNECESSARY LOAD ON STRUCTURE.

(f) If bolt still binding, continue applying load to both jacks while trying to rotate bolt. Unequal jack loads may be required, load should not exceed 5,000 pounds between jacks.

NOTE: If unable to remove bolt, remove QEC and follow procedure called out in 54-00-04.

(g) Use protective material between bolt and driver.

NOTE: Portable hydraulic cylinder or similar equipment may be used.

(h) Using driver and rivet gun from BG35 tool set and locally fabricated bullet (Ref. Fig. 406), remove drag strut aft attachment bolt using rivet gun or similar equipment.

(i) Inspect bolt using nondestructive testing methods (Ref. Structural Repair Manual 54-00-00) and rework if necessary (Ref. Structural Repair Manual 54-11-00).

(j) Obtain new bolt, washers, bearing and nut as required.

(k) Clean attachment area prior to installation.

(2) Install drag strut aft bolt as follows:

(a) Install brass washer next to head of bolt and screw bolt into locally fabricated bullet (Ref. Fig. 406).

(b) Align inner race of bearing in fitting prior to installation of bolt.

(c) Apply thin coating of grease (MIL-G-23827) or equivalent to internal surface of bearing surface of bolt, and exterior surface of bullet.

(d) Use protective material between bolt head and driver.

(e) Using driver and large mallet (pullers or similar equipment may be used) install bolt through drag strut and bearing, installing washers as required (Ref. Fig. 404 and 405).

(f) Install washers and nut at threaded end of bolt (Ref. Fig. 404).

(g) With wrench on bolt head to prevent turning, torque shear nut from 550 to 650 pound feet.

(h) Remove nylon strap.

(3) Remove drag strut inboard forward lug to pylon bolt as follows:

(a) Remove drag strut inboard forward lug-to-pylon, nut and washers. (Ref. Fig. 401 and 404).

(b) Use wrench (BG35 tool set) to turn bolt enough to note ease of rotation and freedom from binding.

(c) Bolt still binding, adjust load to both jacks while trying to rotate bolt. Unequal jack loads may be required; load should not exceed 5,000 pounds between jacks. When bolt rotates (indicating it is free) stop jacking immediately and lock jacks at this point.

NOTE: If unable to remove bolt, remove QEC and follow procedure called out in 54-00-04.

(d) Use protective material between bolt and driver.

(e) Using driver and rivet gun from BG35 tool set and locally fabricated bullet (Ref. Fig. Fig. 407), remove attachment bolt from support fitting.

(f) Inspect bolt using nondestructive testing methods (Ref. Structural Repair Manual 54-00-00) and rework if necessary (Ref. Structural Repair Manual 54-11-00).

(g) Obtain new bolt, washers and nut as required.

(h) Flush attachment area and lubrication hole of attachment bolt with solvent prior to installation.

(4) Install drag strut inboard forward lug to pylon bolt as follows:

(a) Align attach point on pylon, using wing jacks.

(b) Install brass washer next to head of bolt (Ref. Fig. 404 and 405) and screw bolt into locally fabricated bullet (Ref. Fig. 407).

(c) Apply thin coating of grease (MIL-G-23827) or equivalent to internal surface of attach area, surface or bullet.

(d) Using hydraulic press (G/ITEL, 54-11-05), press bolt into fitting. Install all washers in correct position and location between pylon and forward drag strut forward lug (Ref. Fig. 404 and 405).

(e) On threaded side of bolt (inner side), install brass washer then steel washer and shear nut (Ref. Fig. 404 and 405).

(f) With wrench on bolt head to prevent turning,
R torque nut in accordance with Wrench Torque Value
R Table (Ref. 20-51-02).

(g) Lubricate bolt (Ref. 12-26-02).

(5) Repeat Steps 4B(3) and 4B(4) for removal and installation of lower outboard drag strut to pylon attach bolt.

(6) Remove pylon to wing spar fitting outboard bolt as follows:

(a) Remove nut and washers from pylon to wing spar fitting outboard bolt.

CAUTION: LOAD ON JACK SHOULD NOT EXCEED 15,000 POUNDS (TOTAL OF 30,000 POUNDS FOR BOTH JACKS) AS THIS PLACES UNNECESSARY LOAD ON STRUCTURE.

(b) Adjust load on both jacks while trying to rotate bolt. Unequal jack loads may be required, load should not exceed 5,000 pounds between jacks. When bolt rotates (indicating it is free), stop jacking immediately and lock jacks at this point.

NOTE: To determine when load on bolts is relieved, using wrench (BG35 tool set) to turn bolt enough to note ease of rotation and freedom from binding.

If unable to remove bolt, remove QEC and follow procedure called out in 54-00-04.

(c) Use protective material between bolt and driver.

(d) Using driver and rivet gun from BG35 tool set and locally fabricated bullet (Ref. Fig. 407), remove attach bolt from support fitting.

(e) Inspect bolt using non destructive testing methods (Ref. Structural Repair Manual 54-00-00) and rework if necessary (Ref. Structural Repair Manual 54-11-00).

(f) Obtain new bolt, washers, and nut as required.

NOTE: New bolt not required, refurbish per 54-11-00 - Structural Repair Manual.

(g) Flush attachment area and lubrication hole of attachment bolt with solvent prior to installation.

(7) Install pylon to wing support fitting outboard bolt as follows:

(a) Align bolt holes in pylon and support fitting.

(b) Install brass washer next to head of bolt (Ref. Fig. 404) and screw bolt into locally fabricated bullet (Ref. Fig. 407).

(c) Apply thin coating of general aircraft grease (MIL-G-23827) or equivalent to internal surface of bolt, and exterior surface of bullet.

(d) Using hydraulic press (G/ITEL, 54-11-05), press bolt into fitting. Install all washers in correct position and location between surfaces of wing and pylon box fittings (Ref. Fig. 404).

(e) On threaded side of bolt (inner side), install three washers, and shear nut (Ref. Fig. 404 and 405).

CAUTION: STEEL WASHER IS CHAMFERED AND ONE SIDE IS CUT OFF (FLAT), CUT OFF AREA HAS INCREASED CHAMFER. CHAMFERED EDGE OF CUT OFF SIDE OF WASHER MUST NEST IN RADIUS OF FITTING.

(f) Verify chamfered edge of cut off side of steel washer nests in radius of fitting.

NOTE: Clearance of 0.002 to 0.018 inch required between washer and lug face.

(g) Verify there is clearance of 0.002 to 0.018 inch between washer and lug face (Ref. Fig. 405).

R (h) With wrench on bolt head to prevent turning,
R torque nut in accordance with Wrench Torque Value Table (Ref. 20-51-02).

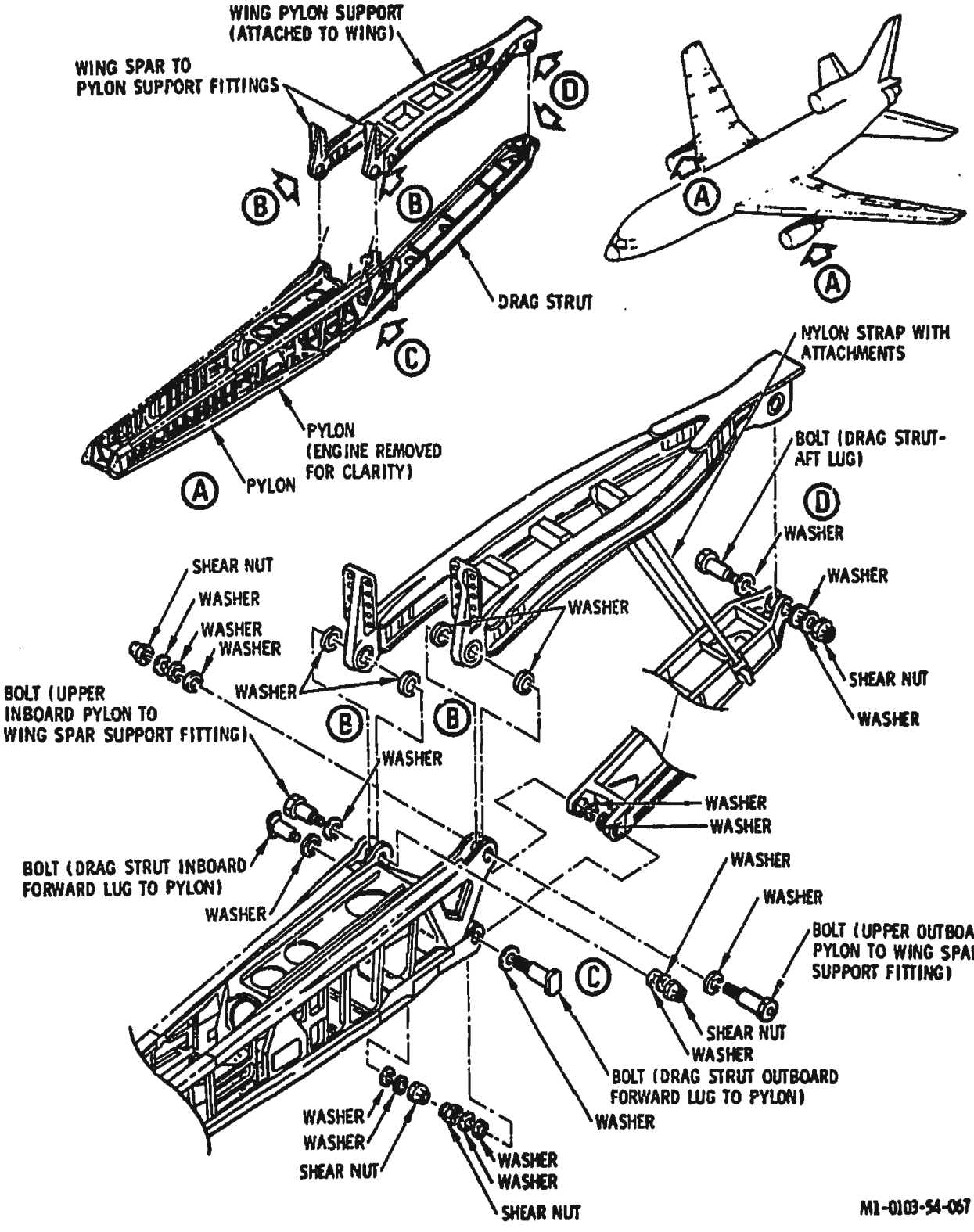
(i) On bolt with lube fitting incorporated, lubricate bolt (Ref. 12-26-02).

(8) Repeat Steps 4B(6) and 4B(7) for removal and installation of pylon to wing support fitting inboard bolt.

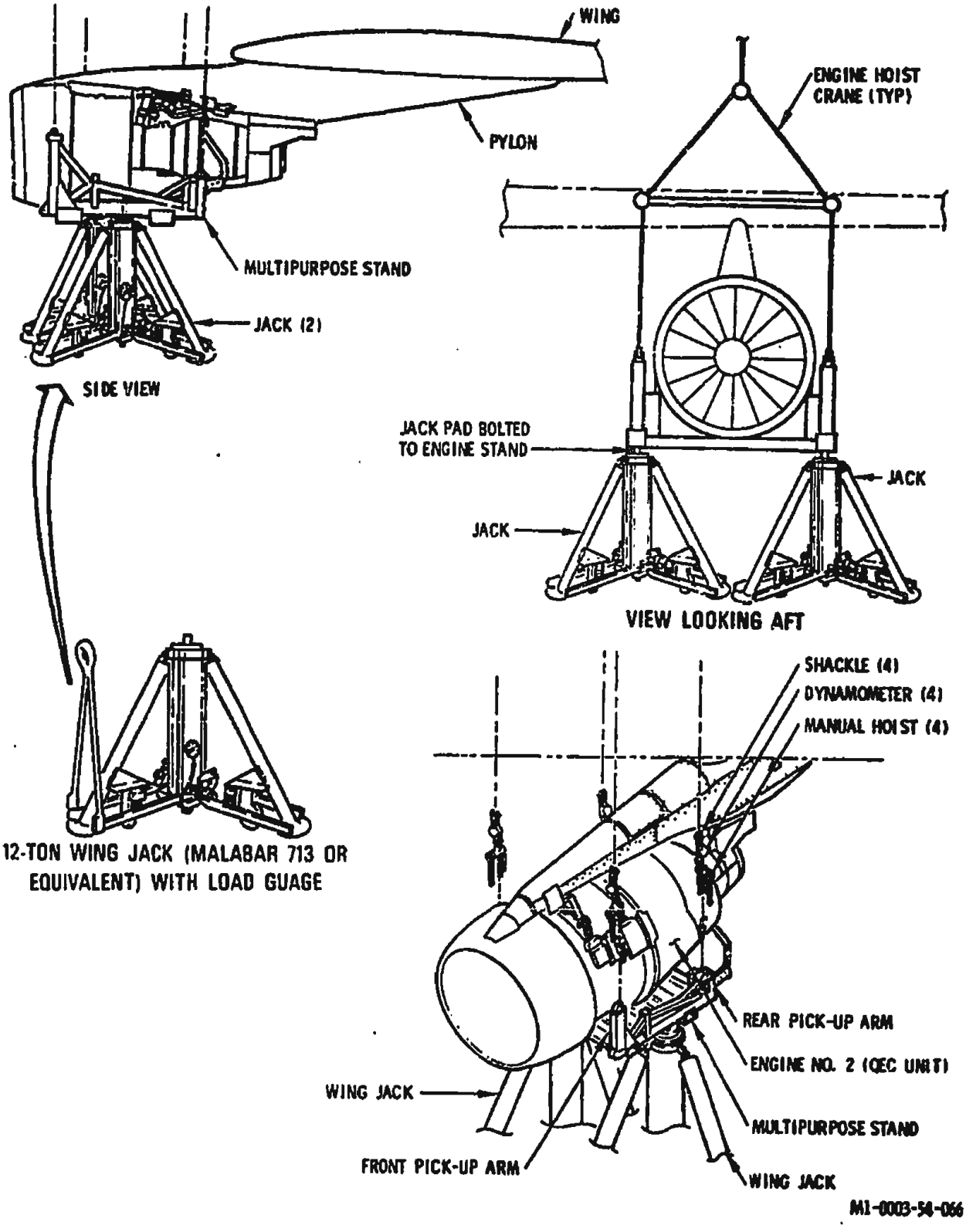
(9) Transfer existing load from jacks to overhead hoist, adhering to cable hoisting load restrictions.

(10) Lower and remove jacks from under multipurpose engine stand.

(11) Lower and remove multipurpose engine stand (or equivalent support cradle assembly) from engine.

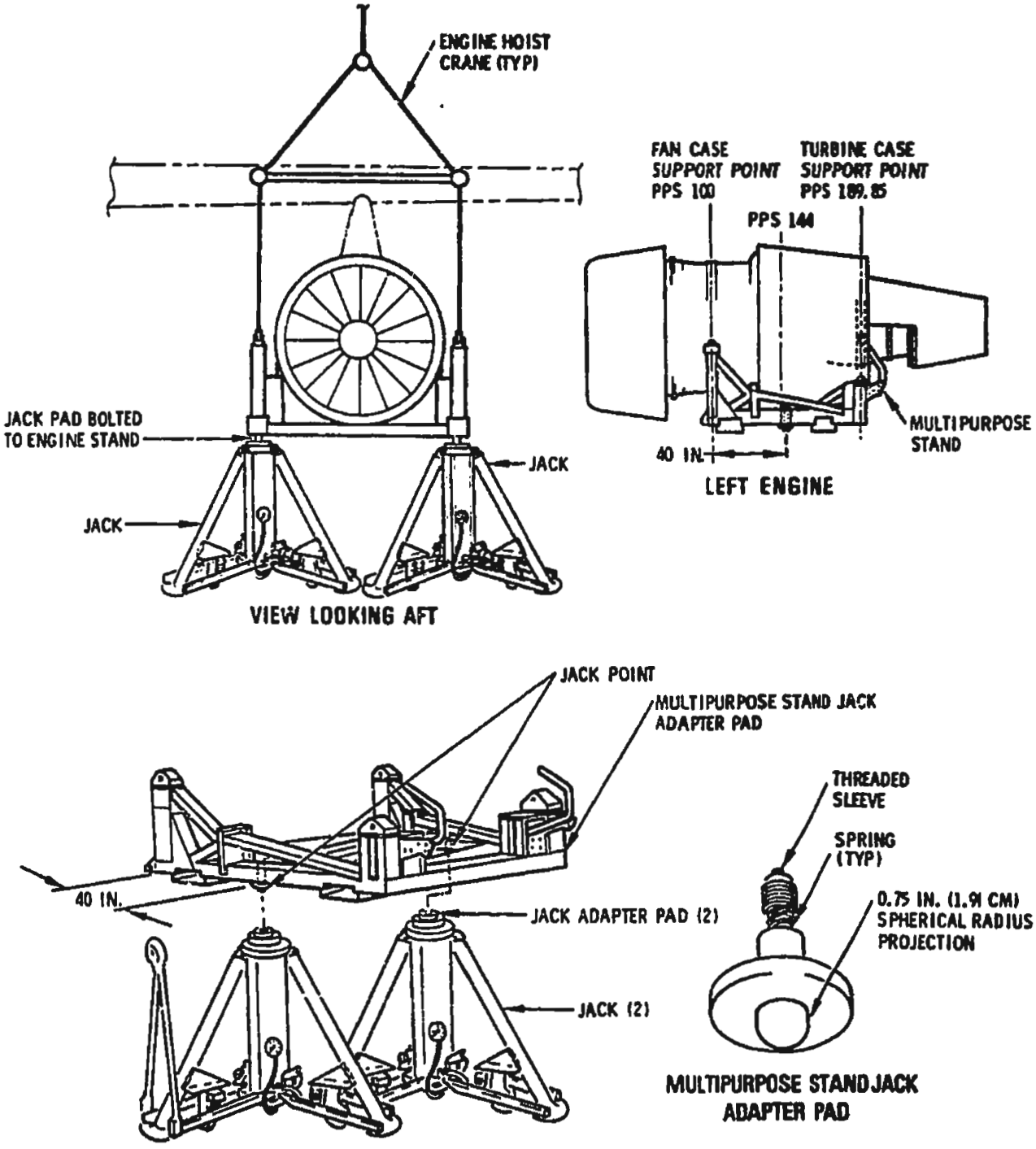


Pylon Bolt Removal and Installation Location
Figure 401

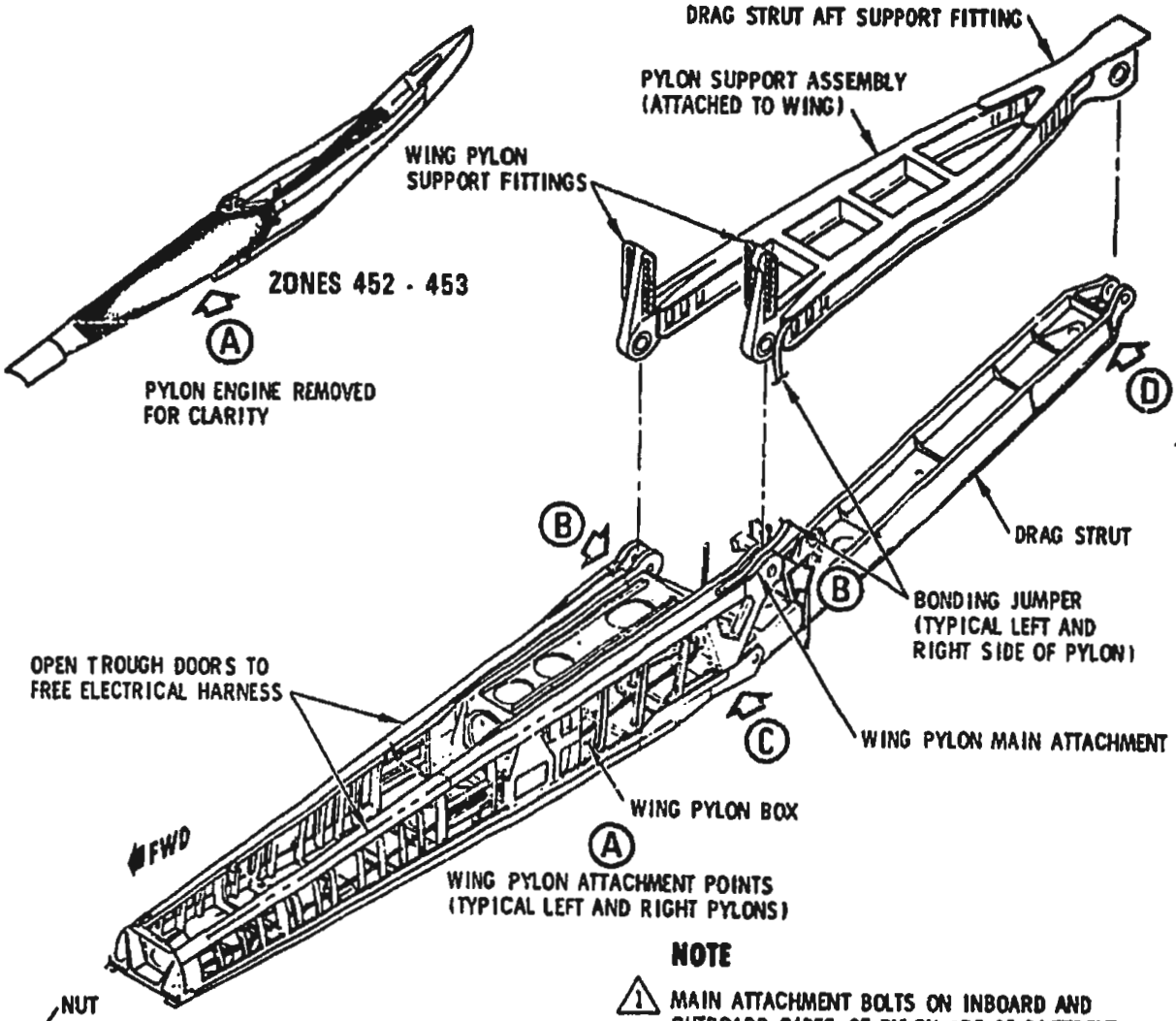


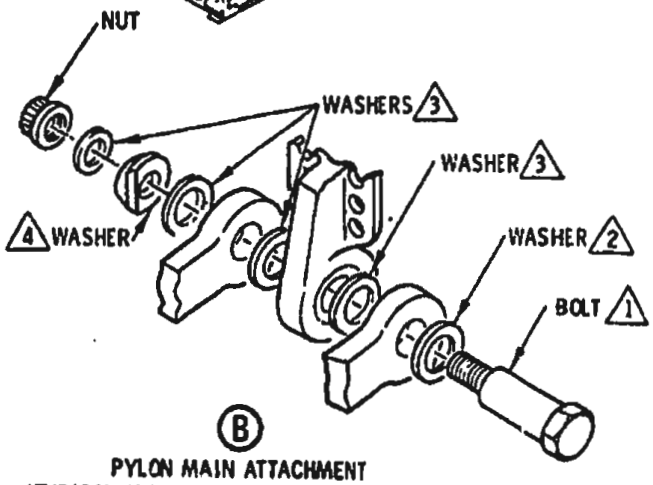
12-TON WING JACK (MALABAR 713 OR EQUIVALENT) WITH LOAD GUAGE

Engine Hoist with Jacks for Pylon Bolt Removal and Installation
Figure 402



Multipurpose Stand Adaption
Figure 403



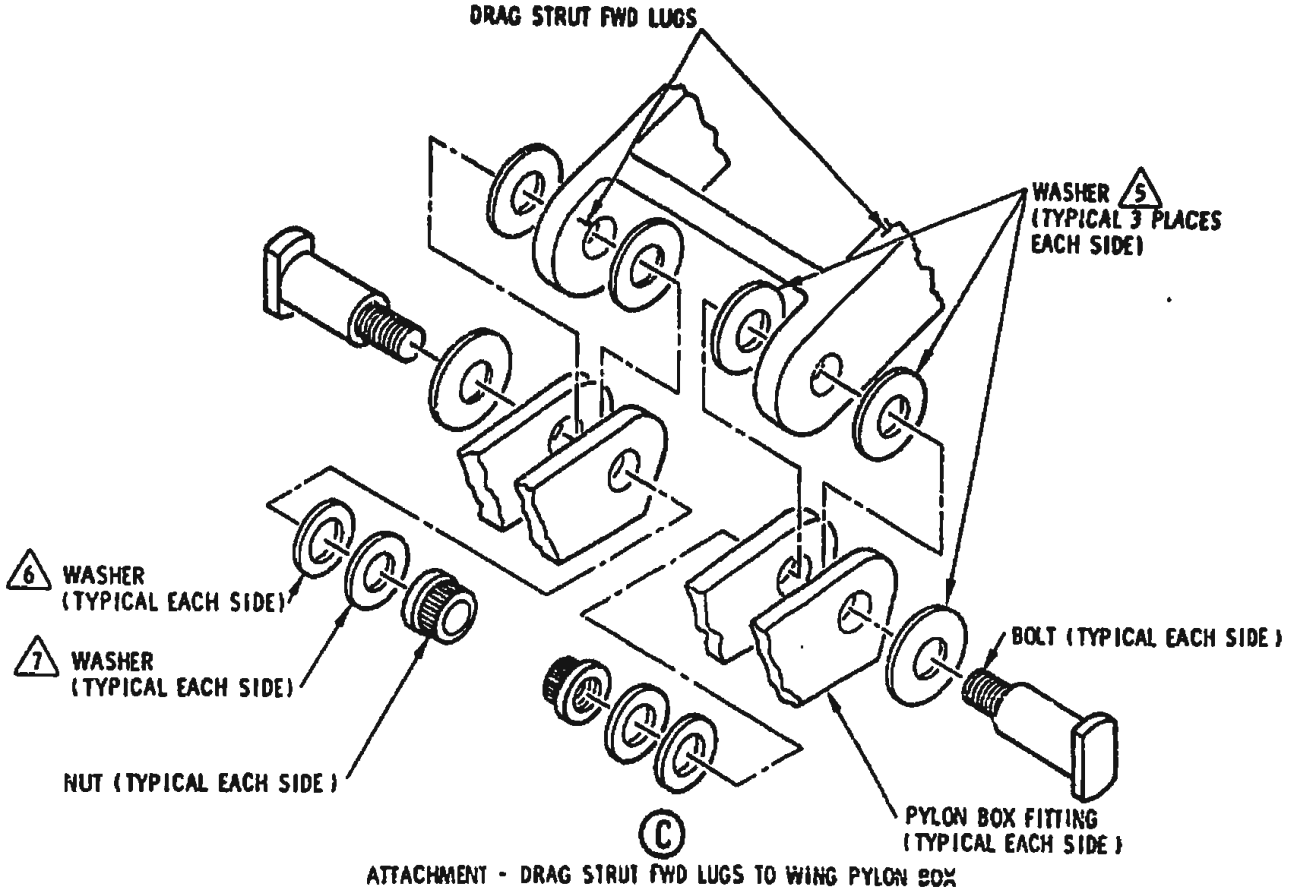


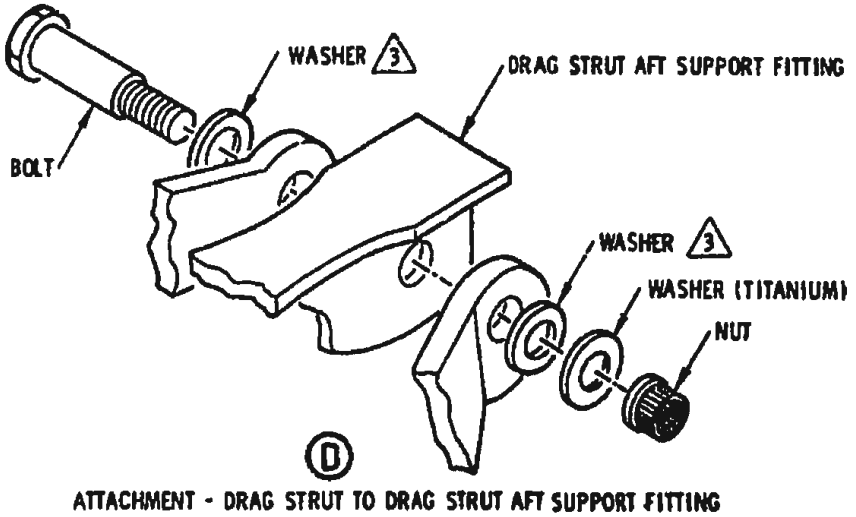
NOTE

1. MAIN ATTACHMENT BOLTS ON INBOARD AND OUTBOARD SIDES OF PYLON ARE OF DIFFERENT LENGTH. EACH BOLT IS INSTALLED FACING INWARD
2. BRASS WASHER, 0.032 INCH THICK. SHIM MAY BE PEELED TO MINIMUM OF 0.010 INCH TO ASSURE BOLT SHOULDER IS FLUSH WITH SURFACE OF FITTING OR USE 0.010 INCH SHIM MINIMUM THICKNESS
3. BRASS WASHER, 0.010 INCH THICK
4. STEEL WASHER IS CHAMFERED AND ONE SIDE IS CUT OFF (FLAT), CUT OFF AREA HAS INCREASED CHAMFER. CHAMFERED EDGE OF CUT OFF SIDE OF WASHER MUST NEST IN RADIUS OF FITTING
5. BRASS WASHER, 0.010 INCH THICK, 4 INCHES O.D.
6. BRASS WASHER, 0.010 INCH THICK, 2.25 INCHES O.D.
7. TITANIUM WASHER, 0.125 INCH THICK, 2.25 INCHES O.D.

MI-0004-54-040

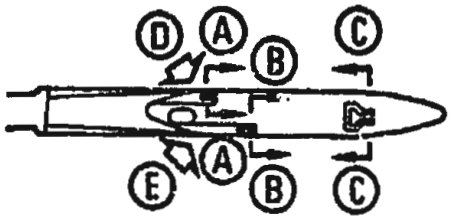
Wing Pylon Attachments
Figure 404 (Sheet 1)


DRAG STRUT FWD LUGS
WASHER 5 (TYPICAL 3 PLACES EACH SIDE)
6 WASHER (TYPICAL EACH SIDE)
7 WASHER (TYPICAL EACH SIDE)
NUT (TYPICAL EACH SIDE)
BOLT (TYPICAL EACH SIDE)
PYLON BOX FITTING (TYPICAL EACH SIDE)
C
ATTACHMENT - DRAG STRUT FWD LUGS TO WING PYLON BOX

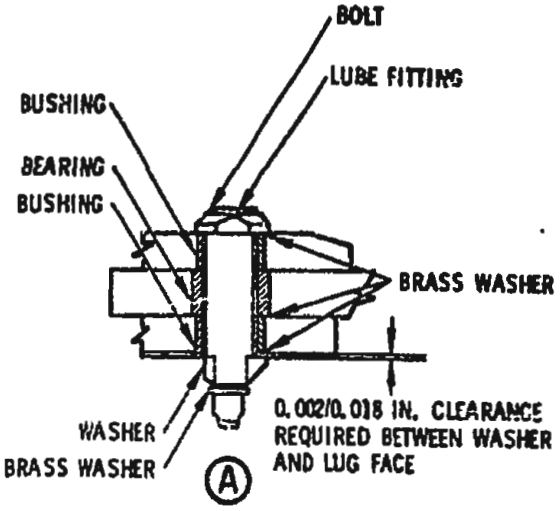


M1-0004-54-041

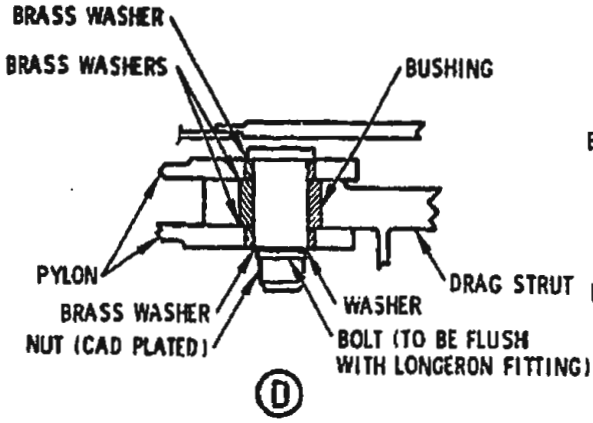
Wing Pylon Attachments
Figure 404 (Sheet 2)



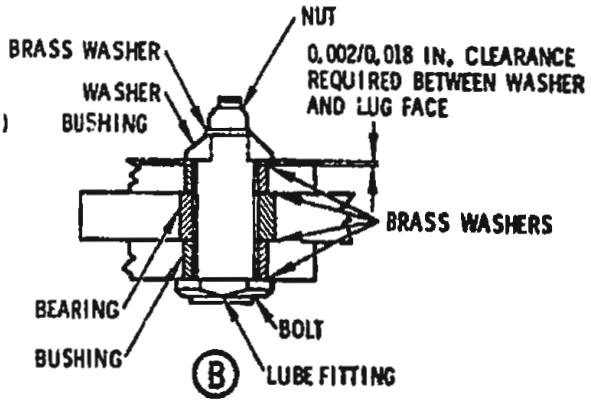
LH PYLON - (VIEW LOOKING DOWN
VIEW D AND E NOT SHOWN)



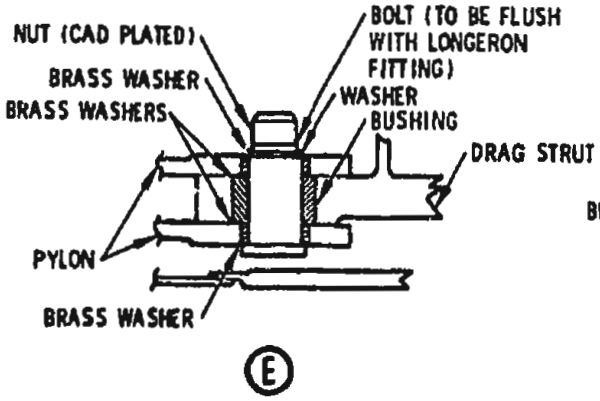
BOLT (UPPER INBOARD PYLON
TO WING SPAR SUPPORT FITTING)



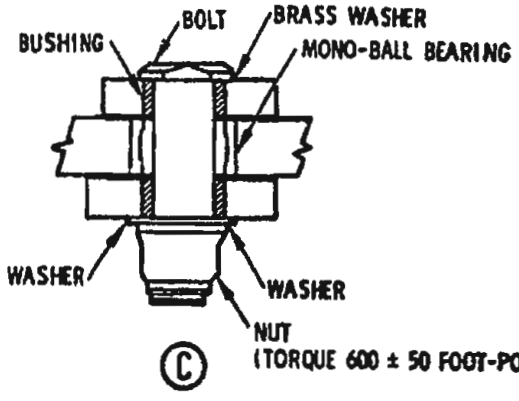
BOLT (DRAG STRUT INBOARD FORWARD
LUG TO PYLON)



BOLT (UPPER OUTBOARD PYLON
TO WING SPAR SUPPORT FITTING)



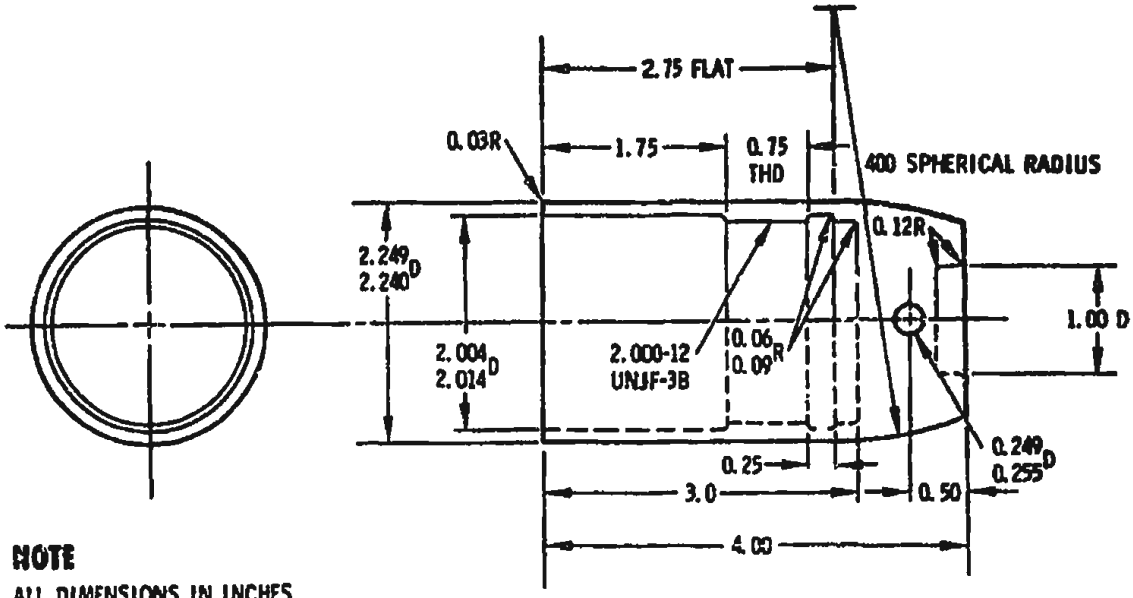
BOLT (DRAG STRUT OUTBOARD
FORWARD LUG TO PYLON)



BOLT (DRAG STRUT AFT LUG)

M1-0001-54-070

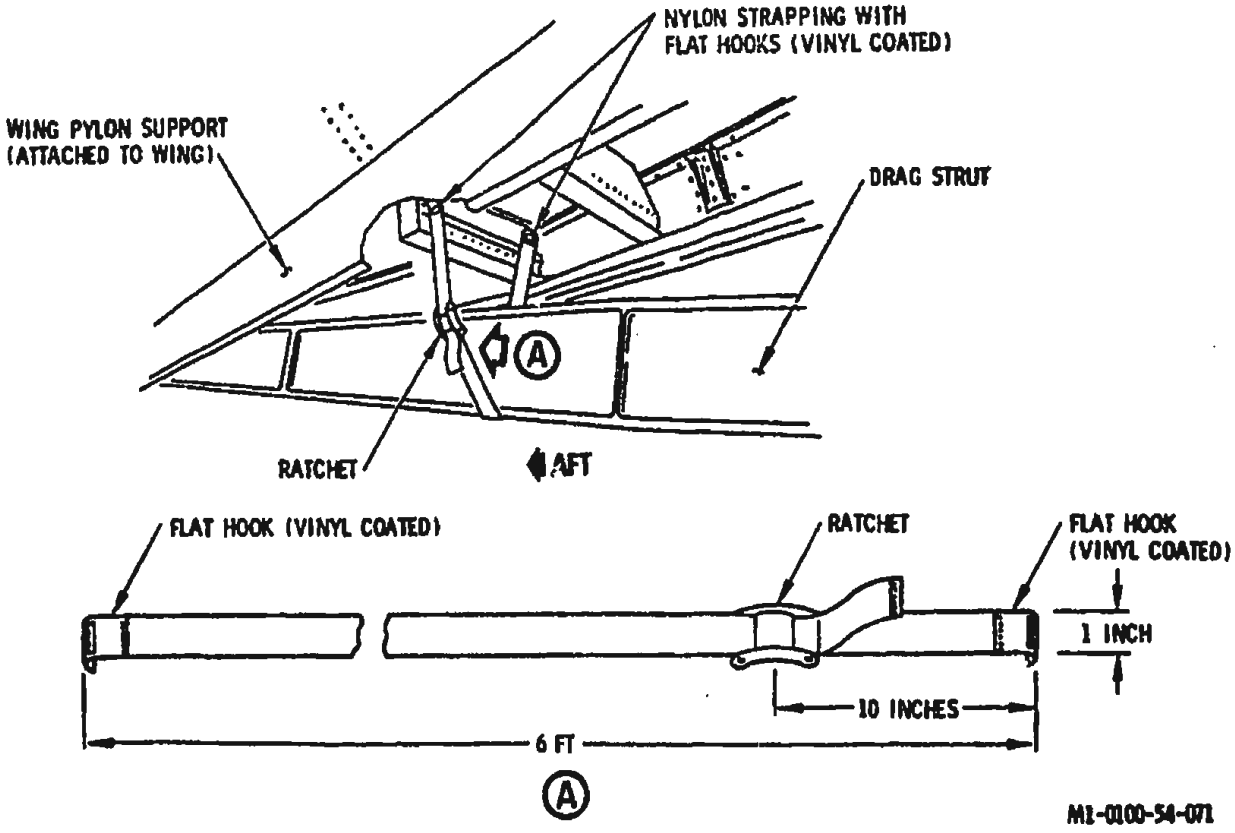
Pylon Bolt Assembly
Figure 405



NOTE

1 ALL DIMENSIONS IN INCHES
2 MATERIAL: 4130 STEEL
3 HEAT TREAT: 160,000 - 180,000 PSI

BULLET-AFT DRAG STRUT WING PYLON
LOCAL MANUFACTURE



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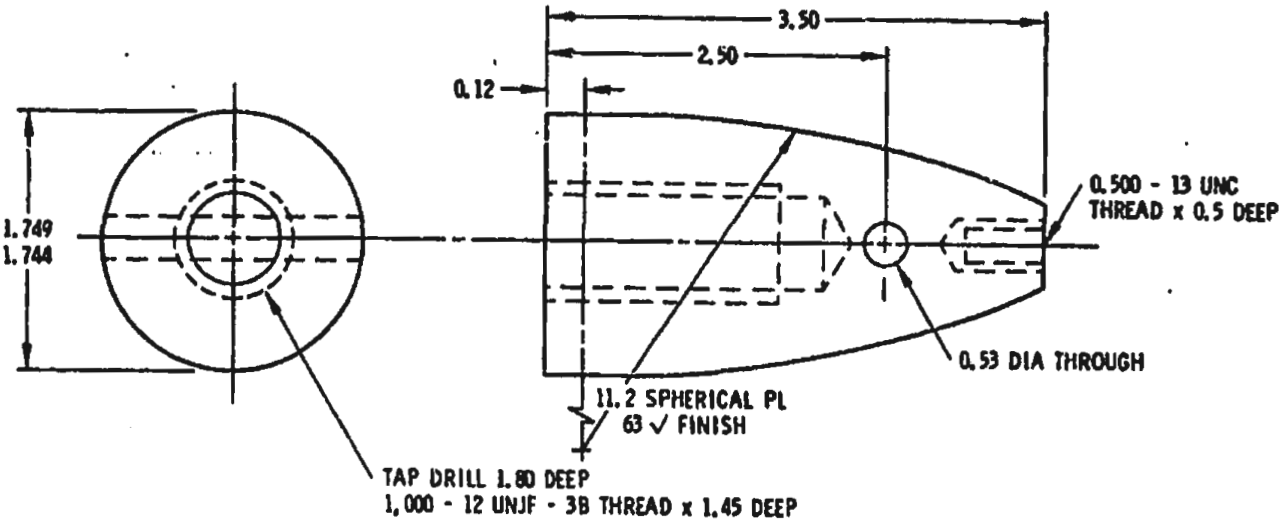
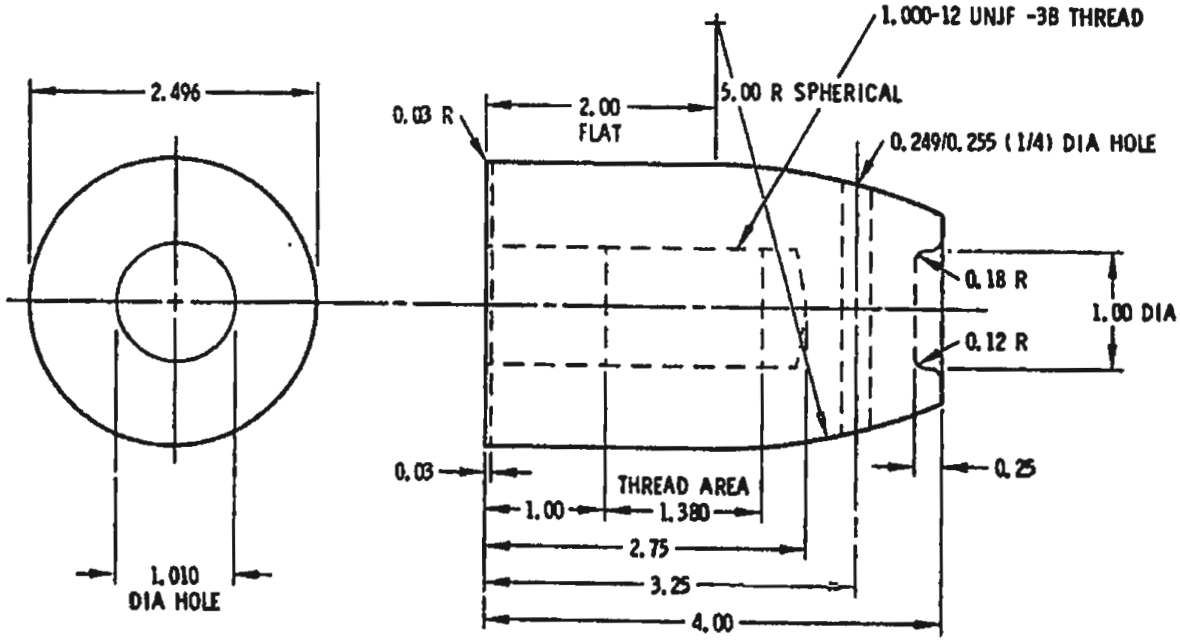
Aft Drag Strut Bolt Removal and Installation
Tool and Nylon Strapping With Attachments
Figure 406



BULLET-DRAG STRUT FORWARD LUG TO PYLON BOX BOLT
LOCAL MANUFACTURE



BULLET-PYLON TO WING SUPPORT FITTING BOLT
LOCAL MANUFACTURE

NOTE

1 ALL DIMENSIONS IN INCHES

2 MATERIAL: STEEL

3 HEAT TREAT: 160,000 TO 180,000 PSI

MI-0000-54-088

Forward Drag Strut and Pylon to Wing Support Fitting Bolt Removal and Installation Tool
Figure 407

PYLON/WING ATTACHMENT BOLTS - REMOVAL AND INSTALLATION WITH ENGINE REMOVED

1. General

Pylon/wing attachment bolts secure No. 1 and No. 3 engine pylon in position on wing. Pylon bolts may be replaced with engine removed using procedure outlined below.

R NOTE: Brass washers shown in Figure 404 need not be replaced if
R they are being extruded from their normal position.
R Deterioration of brass washer is normal, however, if
R washer wears thru and bolt head or steel washer is
R scrubbing on fitting, washer should be replaced at engine
R change or a prior convenient opportunity.

2. Equipment and Materials

Overhead Hoist Crane 10-ton (9,090-Kg) capacity and 30 foot high lift, or equivalent

Dynamometer, Model WT-10-5000, John Chatillon & Sons, Inc., or equivalent

Snatch Block, 2000 to 4000 pound capacity, McKissick Products Corp., or equivalent

Cable Assembly with Shackles of 0.75 inch opening to fit lifting pad; shackle pins must be replaced with 0.375 diameter pin and shackles bushed as necessary to fit new pin

Lifting Pad Assembly PN 1304576, or equivalent

Hydraulic Wing Jack with load gauges 12-ton (10,896-Kg) capacity, Model 713 Malabar Mfg. Co., or equivalent

Pylon Tool Set, BG35 (G/ITEL), or equivalent

Pylon Support, or equivalent

Forward Drag Strut Bolt Remover (G/ITEL, 54-11-04), or equivalent

Pylon Bolt Installation/Removal Tool Kit (G/ITEL, 54-11-05), or equivalent

Solvent (Cleaner) - 1,1,1, Trichlorethane (MIL-T-81533), or equivalent

Grease - Aircraft and Instrument (General Purpose), MIL-G-23827, or equivalent

Strap - Nylon cargo tie down strap, PN 952020-10-72N, or equivalent

3. Referenced Procedures

	6-40-00	Exterior Access Doors and Panels
	6-50-00	Interior Access Doors and Panels
	7-11-00	Wing and Fuselage Jacking - Maintenance Practices
	10-20-00	Mooring - Maintenance Practices
	12-26-02	Wing Pylon Attach Fittings Lubrication - Servicing
R R	54-00-00	Pylon/Wing Attachment Bolts Inspection and Check Procedure - Structural Repair Manual
	54-11-00	Pylon Bolt and Bushing Wear Clearance - Structural Repair Manual
	54-11-00	Bolt Refurbishment - Structural Repair Manual
	54-11-01	Wing Pylon Box Structure - Removal and Installation
	54-51-56	Trailing Edge Wedge Fairing - Removal and Installation
	71-00-01	Wing Mounted QEC Unit - Maintenance Practices

4. Removal/Installation

A. Preliminary Procedure

(1) Remove applicable wing mounted QEC Unit (Ref. 71-00-01).

CAUTION: DO NOT ROTATE FIRE PULL HANDLE WHEN PULLED. FIRE EXTINGUISHING AGENT DISCHARGE SWITCH IS EXPOSED AND ARMED WHEN FIRE EMERGENCY ENGINE SHUTOFF CONTROL FIRE PULL HANDLE HAS BEEN PULLED.

(2) On pilots overhead panel, zone 210, verify that applicable FIRE PULL handle is pulled (Ref. 28-24-00 & 29-11-32).

(3) On pilots overhead circuit breaker panel CB1, zone 210, verify that following circuit breakers are opened and tagged:

(a) FIRE EXTINGUISHER MAIN and ALTN (C10 and C11, or C14 & C15).

(b) THRUST REVERSE (H16 or H18).

(c) FUEL SHUTOFF VALVE-TANK-ENG-1 (D10).

(d) FUEL SHUTOFF VALVE-TANK-ENG-3 (D12).

(e) HYD PUMP and FIREWALL SHUTOFF VALVE CONT SYS A (L15) or SYS B (L18).

CAUTION: ENSURE AIRCRAFT IS PROPERLY GROUNDED AND LANDING GEAR DOWNLOCK SAFETY PINS ARE INSTALLED.

(4) Verify that aircraft is properly grounded and landing gear downlock safety pins are installed.

(5) Verify fuel shutoff valve is in closed position.

(6) Position workstands and platforms as required.

(7) Remove panels 452/462 FR, 452/462 FL, 453/463 GR, 453/463 GL (Ref. 6-40-00).

CAUTION: DO NOT EXCEED LOAD OF 7000 POUNDS ON A SINGLE FORWARD HOIST OR 4500 POUNDS ON A SINGLE REAR HOIST.

(8) Using overhead hoist crane, raise pylon enough to relieve load on pylon and drag strut attachment bolts (Ref. Fig. 403).

NOTE: To determine when load on bolts is relieved, use wrench (BG35 tool set) to turn bolts enough to note ease of rotation and freedom from binding.

(8) For alternate procedure to relieve load on pylon and drag strut attachment bolts, perform the following:

R (a) Ensure main landing gear main wheels are chocked and all landing gear downlock safety pins are installed.

CAUTION: PARK AIRCRAFT IN LEVEL SHELTERED AREA ONLY TO AVOID WINDY CONDITIONS. DO NOT JACK AIRCRAFT IF GROSS WEIGHT EXCEEDS 340,000 POUNDS (154,195 Kg). DO NOT EXCEED ALLOWABLE LOADS AT JACKING POINTS (REF. 7-11-00).

(b) Place aircraft on wing and fuselage jacks to stabilize and provide support as necessary for proper balance of aircraft (Ref. 7-11-00 and 10-20-00).

(c) Using hydraulic wing jack, raise pylon enough to relieve load on pylon and drag strut attachment bolts (Ref. Fig. 404).

B. Removal of Drag Strut Aft Bolt

(1) Remove wedge assembly (Ref. 54-51-56).

(2) Attach one end nylon cargo tie down strap to inside of pylon support assembly and the other end to aft pylon drag strut, secure strap.

(3) Use protective material between bolt and driver.

(4) Using driver and rivet gun from BG35 tool set and locally fabricated bullet (Ref. Fig. 405), remove drag strut aft bolt using rivet gun.

R (5) Inspect bolt using non destructive testing methods
R (Ref. Structural Repair Manual 54-00-00) and rework if
R necessary (Ref. Structural Repair Manual 54-11-00).

(6) Obtain new bolt, washers, bearing and nut as required.

(7) Clean attachment area prior to installation.

C. Installation of Drag Strut Aft Bolt

(1) Install brass washer next to head of bolt and screw bolt into locally fabricated bullet (Ref. Fig. 405).

(2) Align inner race of bearing in fitting prior to installation of bolt.

(3) Apply thin coating of grease (MIL-G-23827) or equivalent to internal surface of bearing, bearing surface of bolt, and exterior surface of bullet.

(4) Use protective material between bolt head and driver.

(5) Using driver and large mallet, drive bolt through drag strut and bearing, installing washers as required (Ref. Fig. 401).

(6) Install washers and nut at threaded end of bolt (Ref. Fig. 401).

(7) With wrench on bolt head to prevent turning, torque shear nut from 550 to 650 pound feet.

(8) Remove nylon strap.

D. Removal of Pylon to Wing Support Fitting Inboard and Outboard Bolts

(1) Use protective material between bolt and driver.

(2) Using driver and rivet gun from BG35 tool set and locally fabricated bullet (Ref. Fig. 406), remove attach bolt from support fitting.

R (3) Inspect bolt using non destructive testing methods
R (Ref. Structural Repair Manual 54-00-00) and rework if
R necessary (Ref. Structural Repair Manual 54-11-00).

(4) Obtain new bolt, washers and nut as required.

(5) Flush attachment area and lubrication hole of attachment bolt with solvent prior to installation.

E. Installation of Pylon to Wing Support Fitting Inboard and Outboard Bolts

(1) Using overhead hoist crane raise pylon enough to align bolt holes in pylon and support fitting.

(2) Install brass washer next to head of bolt (Ref. Fig. 401) and screw bolt into locally fabricated bullet (Ref. Fig. 406).

(3) Apply thin coating of grease (MIL-G-23827) or equivalent to internal surface of bullet.

(4) Using hydraulic press, press bolt into fitting. Install all washers in correct position and location between surfaces of wing and pylon box fittings (Ref. Fig. 401).

(5) On threaded side of bolt (inner side) install three washers (Ref. Fig. 401).

CAUTION: STEEL WASHER IS CHAMFERED AND ONE SIDE IS CUT OFF (FLAT), CUT OFF AREA HAS INCREASED CHAMFER. THE CHAMFERED EDGE OF CUT OFF SIDE OF WASHER MUST NEST IN RADIUS OF FITTING.

(6) Verify chamfered edge of cut off side of steel washer nests in radius of fitting.

(7) Install shear nut and with wrench on bolt head to prevent turning, torque nut 1400 to 1500 pound inches.

NOTE: Clearance of 0.002 to 0.018 inch required between washer and lug face.

(8) Verify there is clearance of 0.002 to 0.018 inch between washer and lug face (Ref. Fig. 402).

(9) Lubricate bolt (Ref. 12-26-02).

F. Removal of Drag Strut Inboard and Outboard Forward Lugs to Pylon Bolts

(1) Use protective material between bolt and driver.

(2) Using driver and rivet gun from BG35 tool set and locally fabricated bullet (Ref. Fig. 406), remove attachment bolt from support fitting.

R (3) Inspect bolt using non destructive testing methods
R (Ref. Structural Repair Manual 54-00-00) and rework if
R necessary (Ref. Structural Repair Manual 54-11-00).

(4) Obtain new bolt, washer and nut as required.

(5) Flush attachment area and lubrication hole of attachment bolt with solvent prior to installation.

G. Installation of Drag Strut Inboard and Outboard Forward Lugs to Pylon Bolts

(1) Using overhead hoist crane raise pylon enough to align attach point on pylon.

(2) Install brass washer next to head of bolt (Ref. Fig. 401) and screw bolt into locally fabricated bullet (Ref. Fig. 406).

(3) Apply thin coating of grease (MIL-G-23827) or equivalent to internal surface of attach area, surface of bullet.

(4) Using hydraulic press, press bolt into fitting. Install all washers in correct position and location between pylon and forward drag strut forward lug (Ref. Fig. 401).

(5) On threaded side of bolt (inner side), install brass washer then steel washer and shear nut (Ref. Fig. 401).

(6) With wrench on bolt head to prevent turning, torque nut 1400 to 1500 pound inches.

(7) Lubricate bolt (Ref. 12-26-02).

H. Completion Procedure

(1) Lower and remove engine pylon load bar or equivalent support assembly from pylon.

(2) Install applicable wing mounted QEC Unit (Ref. 71-00-01).

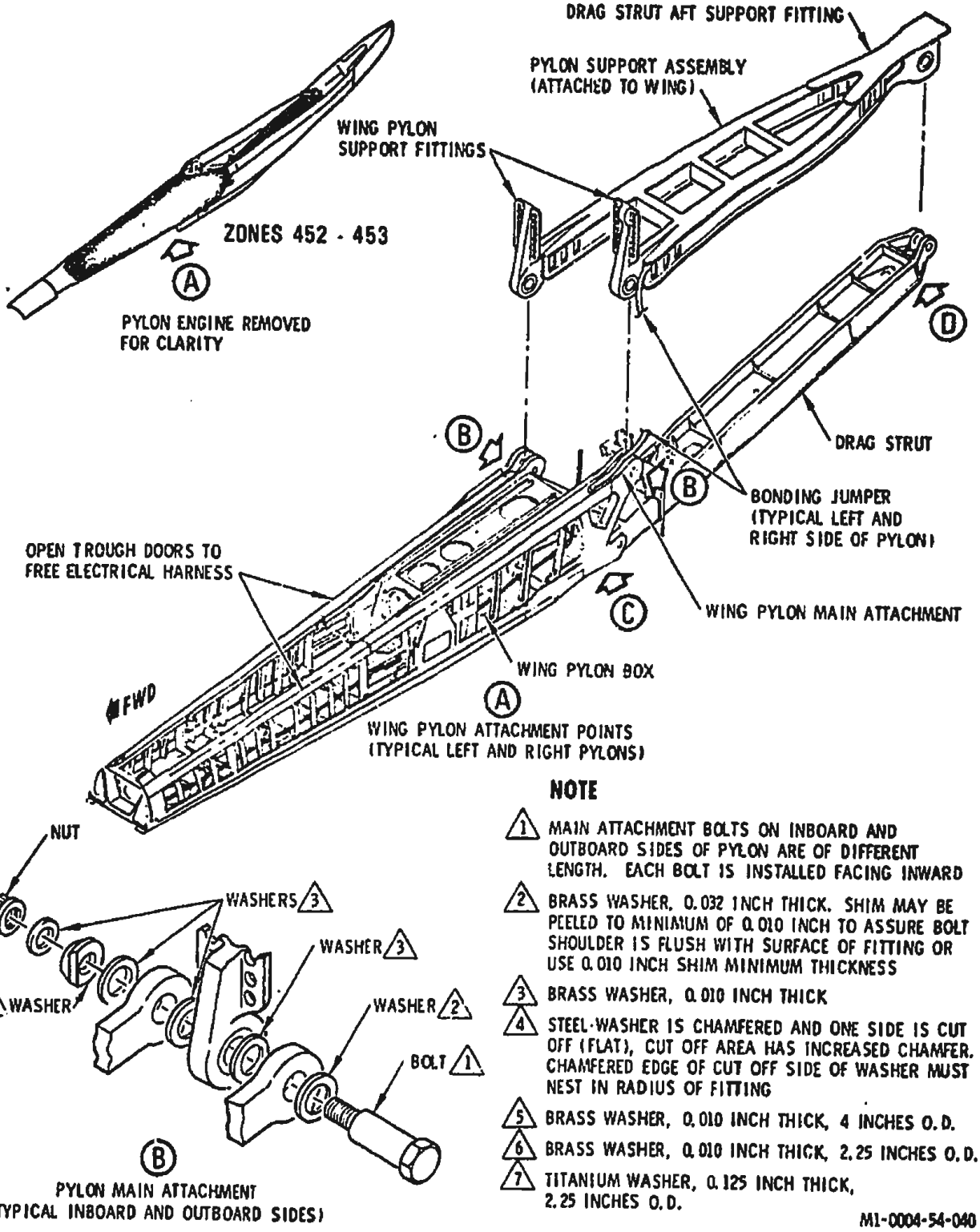
(3) Install panels 452/462 FR, 452/462 FL, 453/463 GR, 453/463 GL (Ref. 6-40-00).

(4) Remove workstands and platforms.

(5) Verify fuel shutoff valve is in open position.

(6) On pilots overhead circuit breaker panel CB1, zone 210, remove tags and close circuit breakers opened in Step 4A(3).

(7) On pilots overhead panel, zone 210, verify that applicable FIRE PULL handle is pushed into normal position.



NOTE

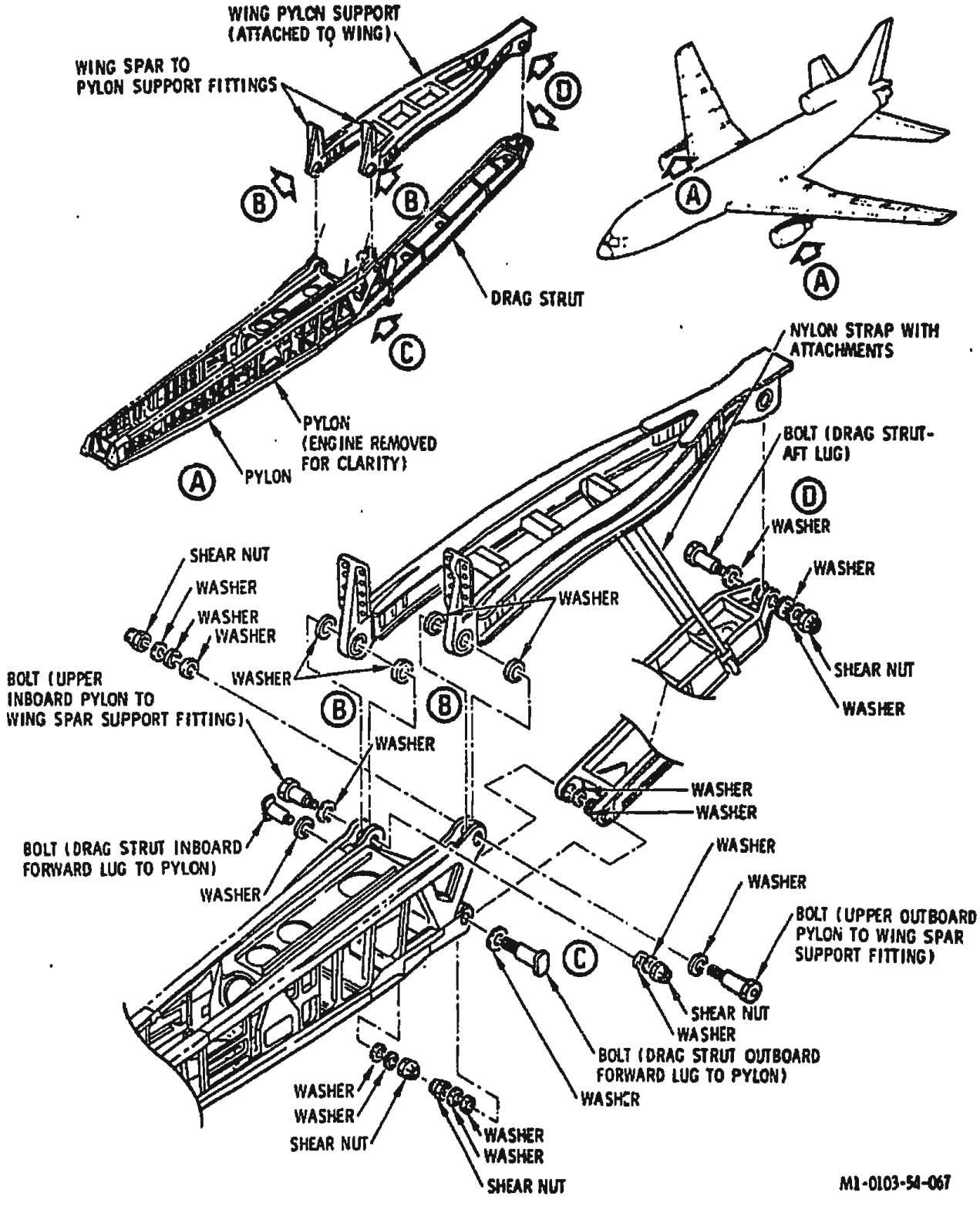
1. MAIN ATTACHMENT BOLTS ON INBOARD AND OUTBOARD SIDES OF PYLON ARE OF DIFFERENT LENGTH. EACH BOLT IS INSTALLED FACING INWARD
2. BRASS WASHER, 0.032 INCH THICK. SHIM MAY BE PEELED TO MINIMUM OF 0.010 INCH TO ASSURE BOLT SHOULDER IS FLUSH WITH SURFACE OF FITTING OR USE 0.010 INCH SHIM MINIMUM THICKNESS
3. BRASS WASHER, 0.010 INCH THICK
4. STEEL WASHER IS CHAMFERED AND ONE SIDE IS CUT OFF (FLAT), CUT OFF AREA HAS INCREASED CHAMFER. CHAMFERED EDGE OF CUT OFF SIDE OF WASHER MUST NEST IN RADIUS OF FITTING
5. BRASS WASHER, 0.010 INCH THICK, 4 INCHES O.D.
6. BRASS WASHER, 0.010 INCH THICK, 2.25 INCHES O.D.
7. TITANIUM WASHER, 0.125 INCH THICK, 2.25 INCHES O.D.

M1-0004-54-040

R R Wing Pylon Fitting Attachments
Figure 401 (Sheet 1)

EFFECTIVITY: ALL

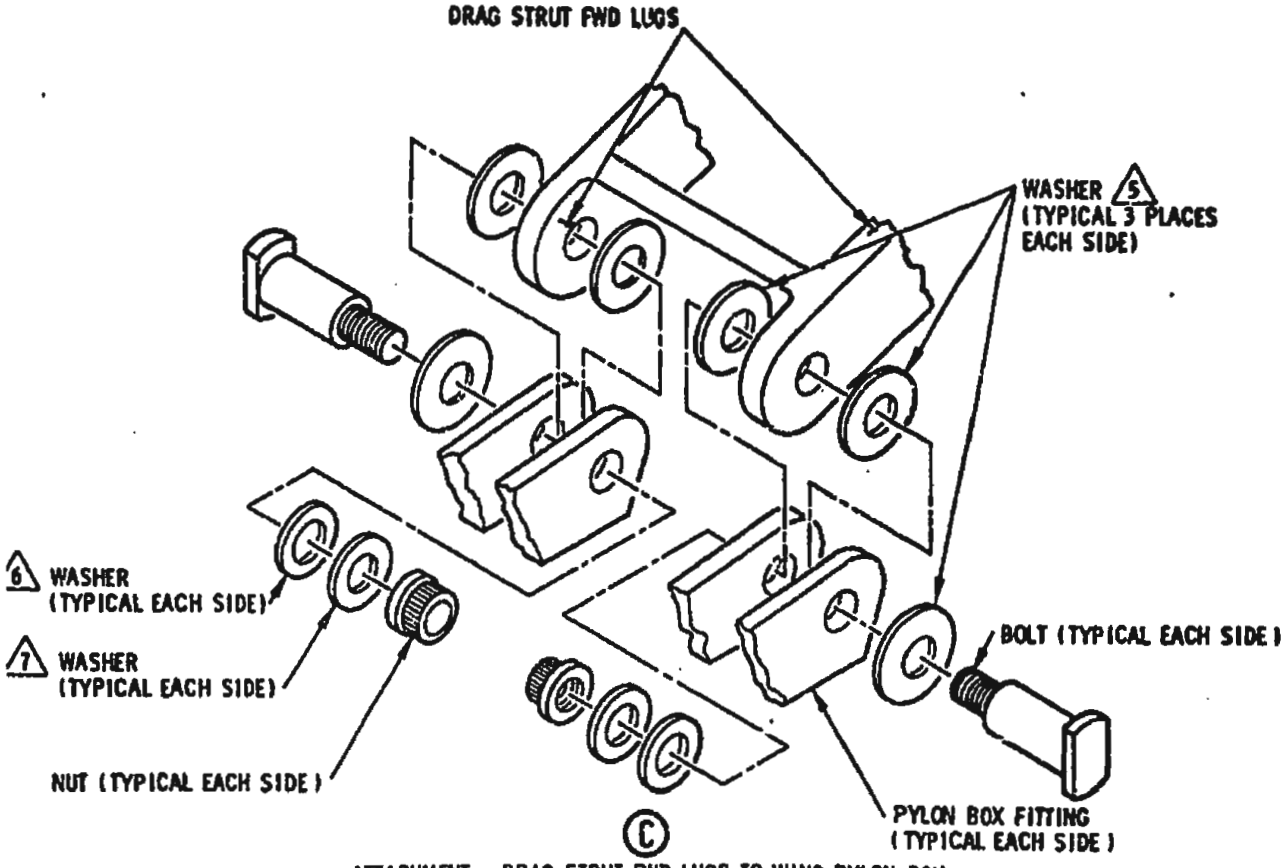
001B

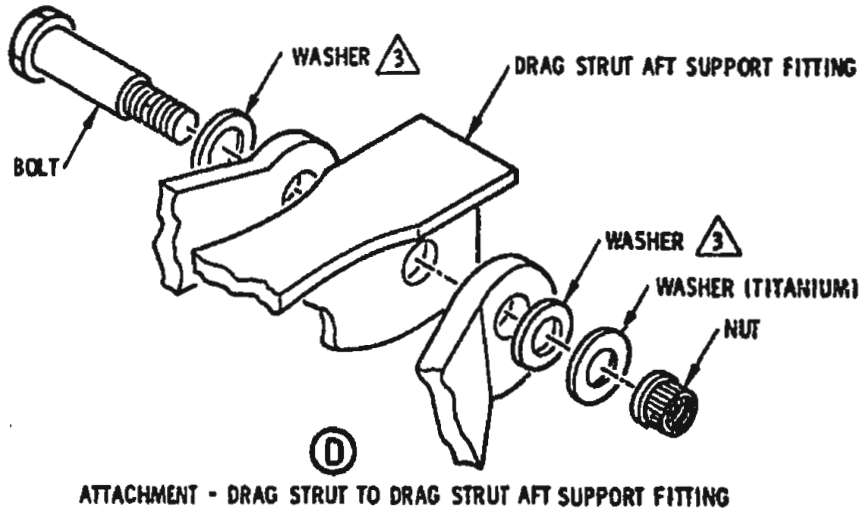


R Wing Pylon Fitting Attachments
R Figure 401 (Sheet 2)

EFFECTIVITY: ALL

001B


DRAG STRUT FWD LUGS
WASHER 5 (TYPICAL 3 PLACES EACH SIDE)
6 WASHER (TYPICAL EACH SIDE)
7 WASHER (TYPICAL EACH SIDE)
NUT (TYPICAL EACH SIDE)
BOLT (TYPICAL EACH SIDE)
PYLON BOX FITTING (TYPICAL EACH SIDE)
C
ATTACHMENT - DRAG STRUT FWD LUGS TO WING PYLON BOX



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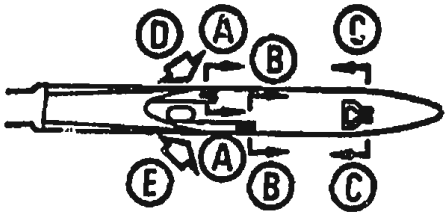
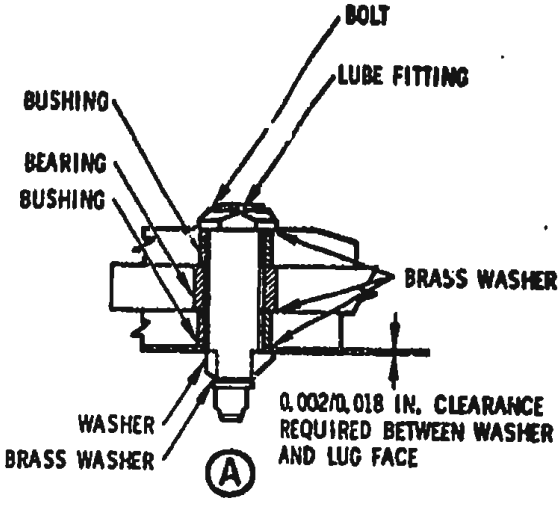
R Wing Pylon Fitting Attachments
R Figure 401 (Sheet 3)

EFFECTIVITY: ALL

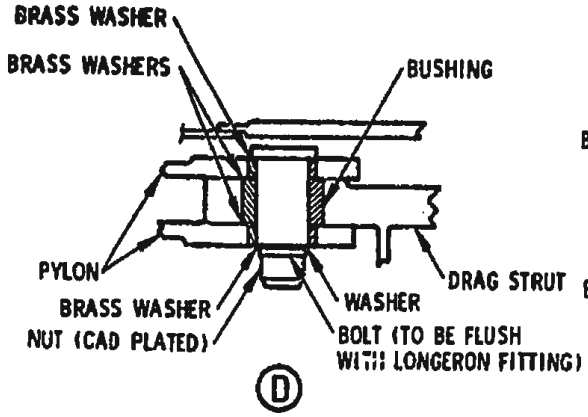
001B



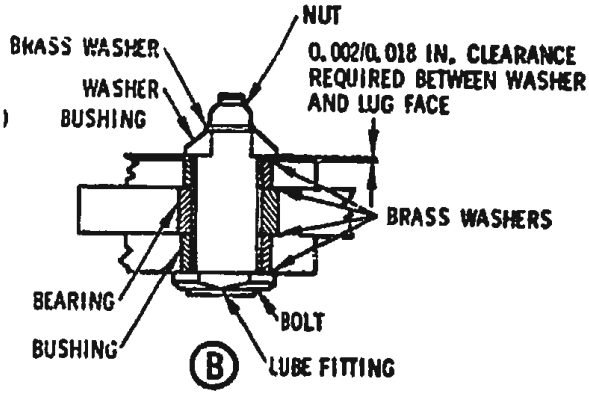
LH PYLON - (VIEW LOOKING DOWN VIEW D AND E NOT SHOWN)



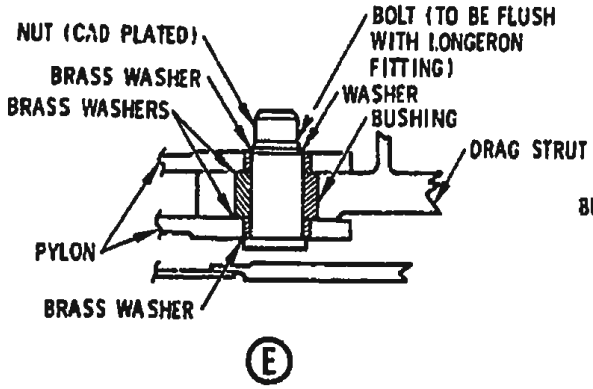
BOLT (UPPER INBOARD PYLON TO WING SPAR SUPPORT FITTING)



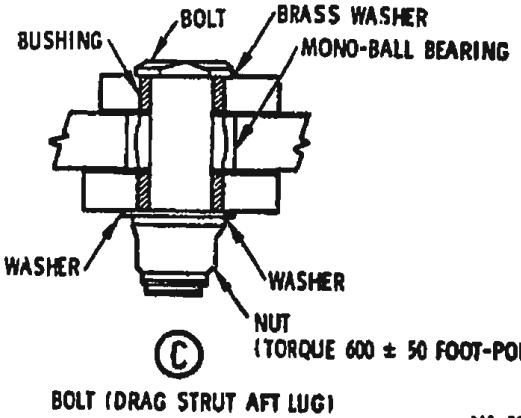
BOLT (DRAG STRUT INBOARD FORWARD LUG TO PYLON)



BOLT (UPPER OUTBOARD PYLON TO WING SPAR SUPPORT FITTING)



BOLT (DRAG STRUT OUTBOARD FORWARD LUG TO PYLON)



BOLT (DRAG STRUT AFT LUG)

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R
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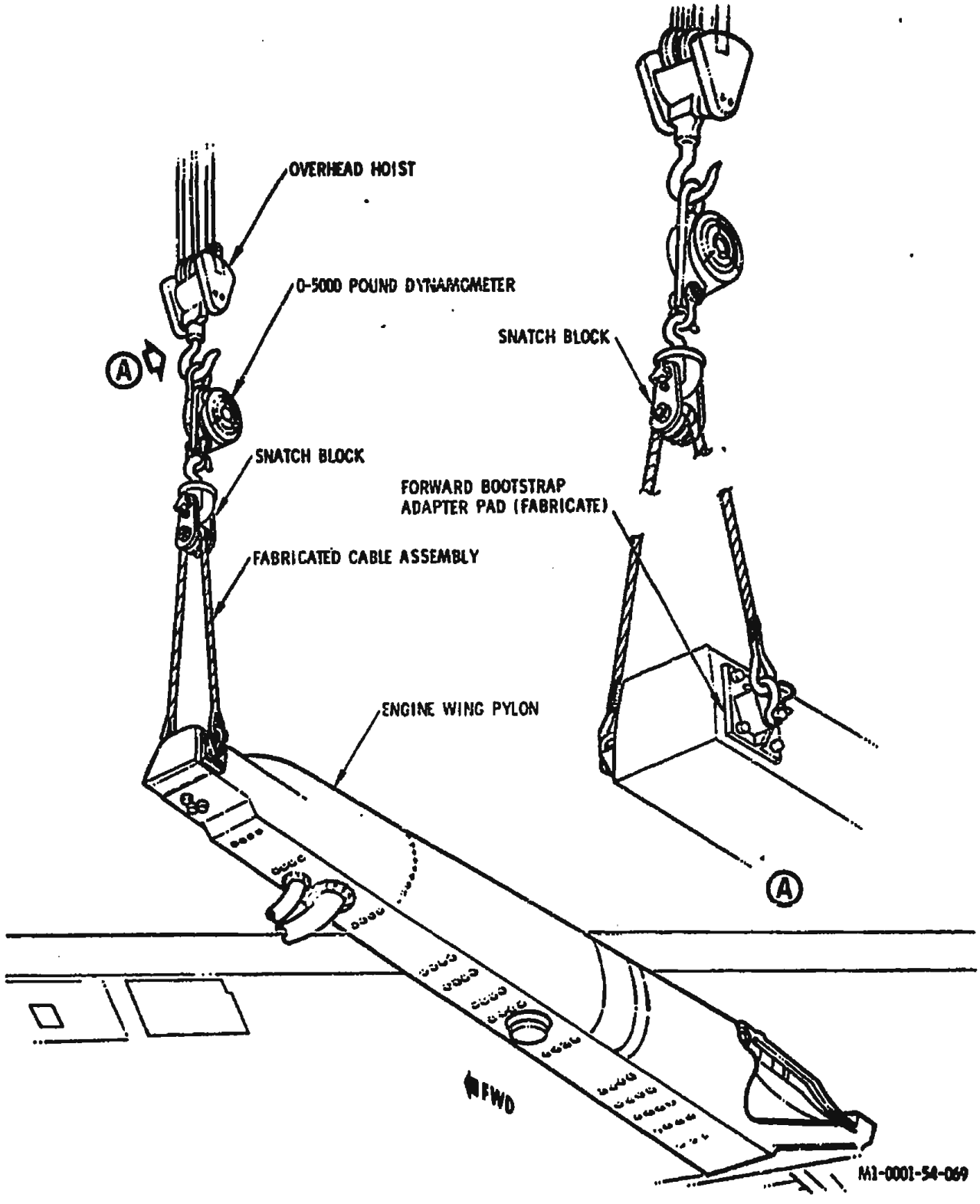
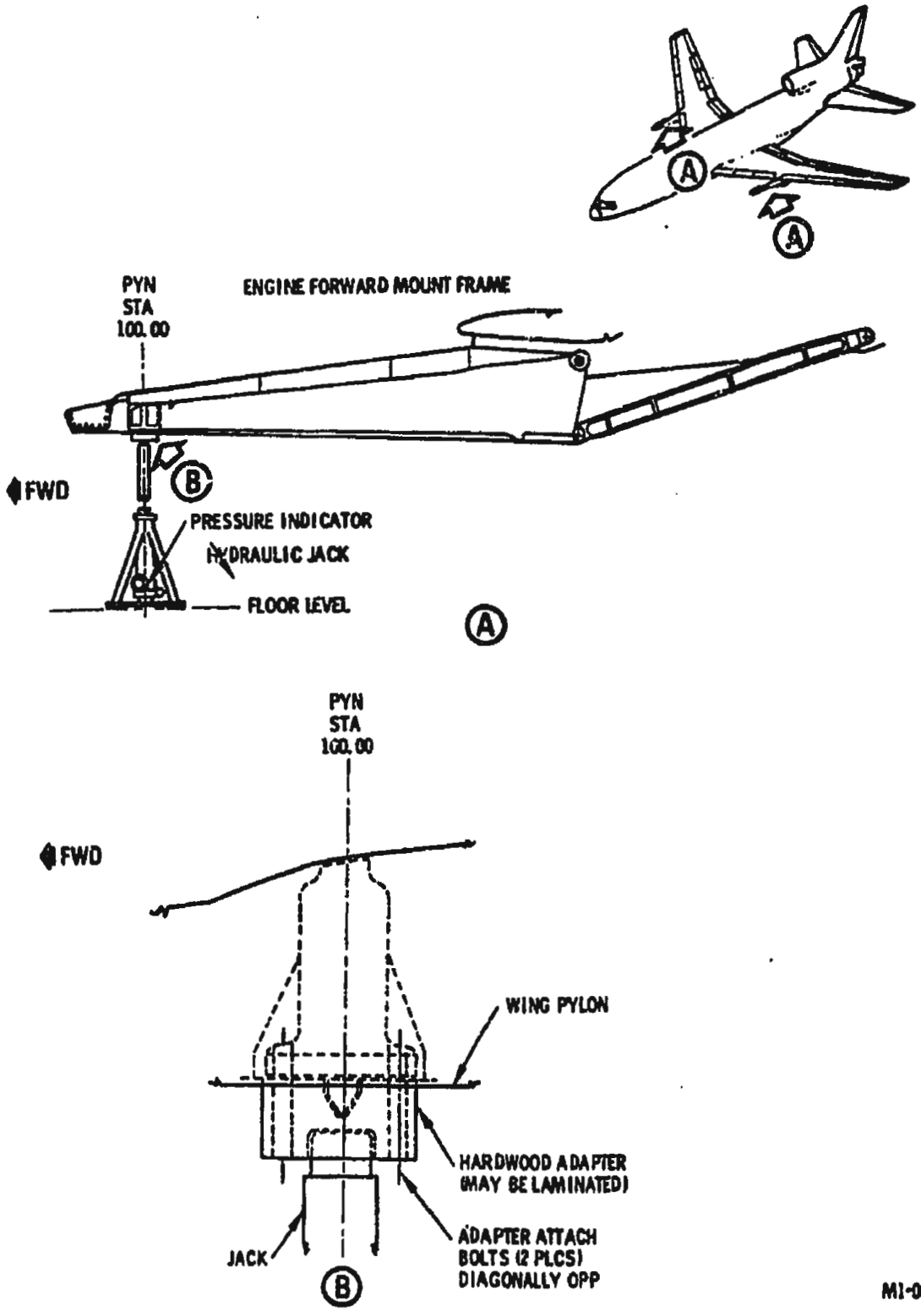
Pylon Bolt Assembly
Figure 402

EFFECTIVITY: ALL

001B

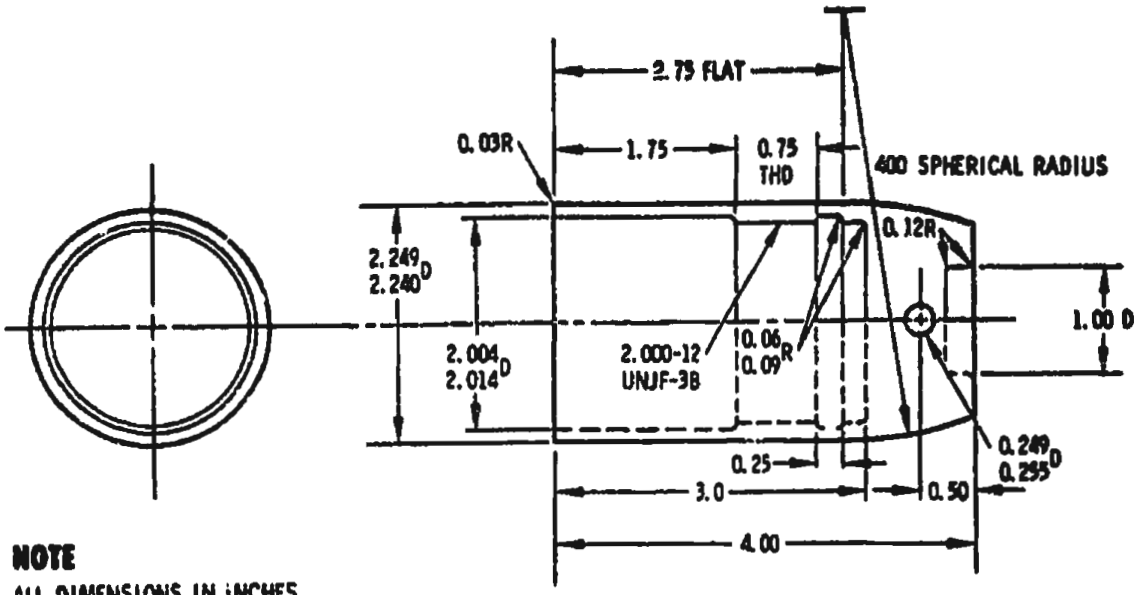


R Pylon Support with Overhead Hoist Crane
R Figure 403



R Pylon Support with Hydraulic Wing Jack
R Figure 404

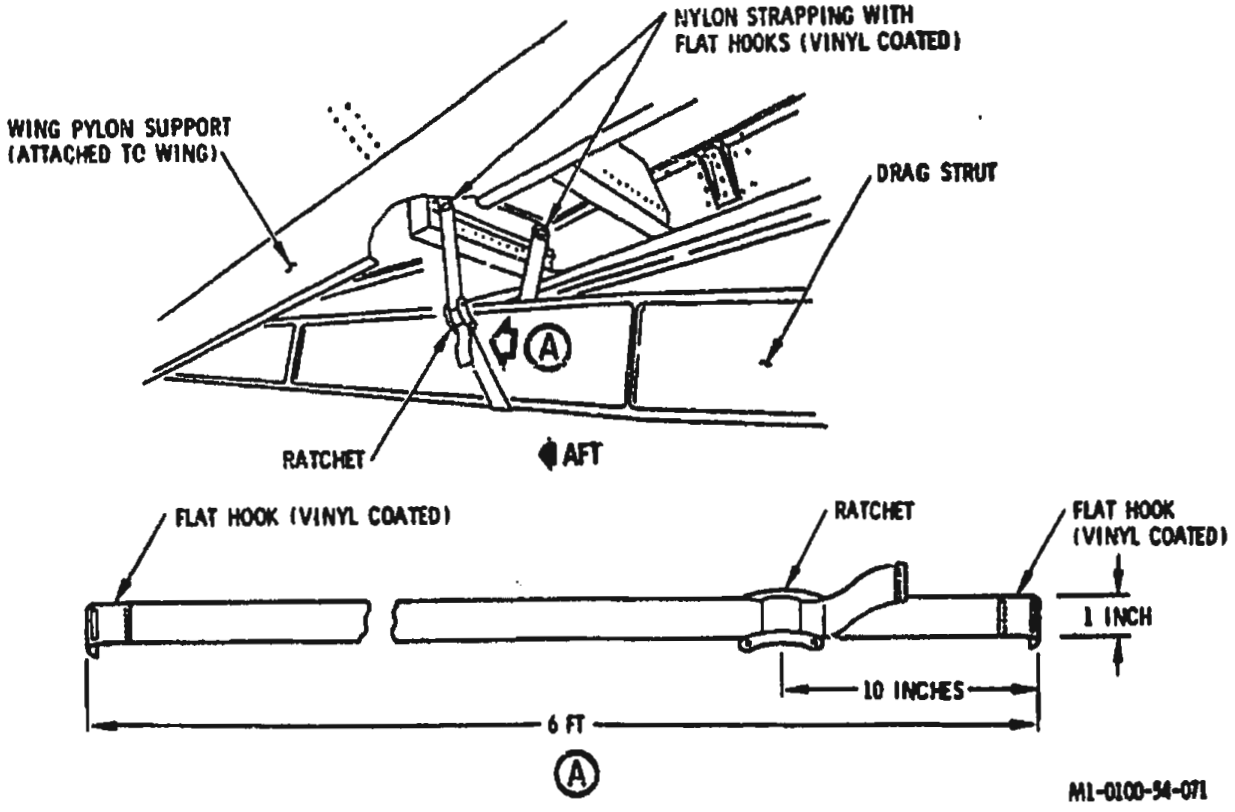
R EFFECTIVITY: ALL



NOTE

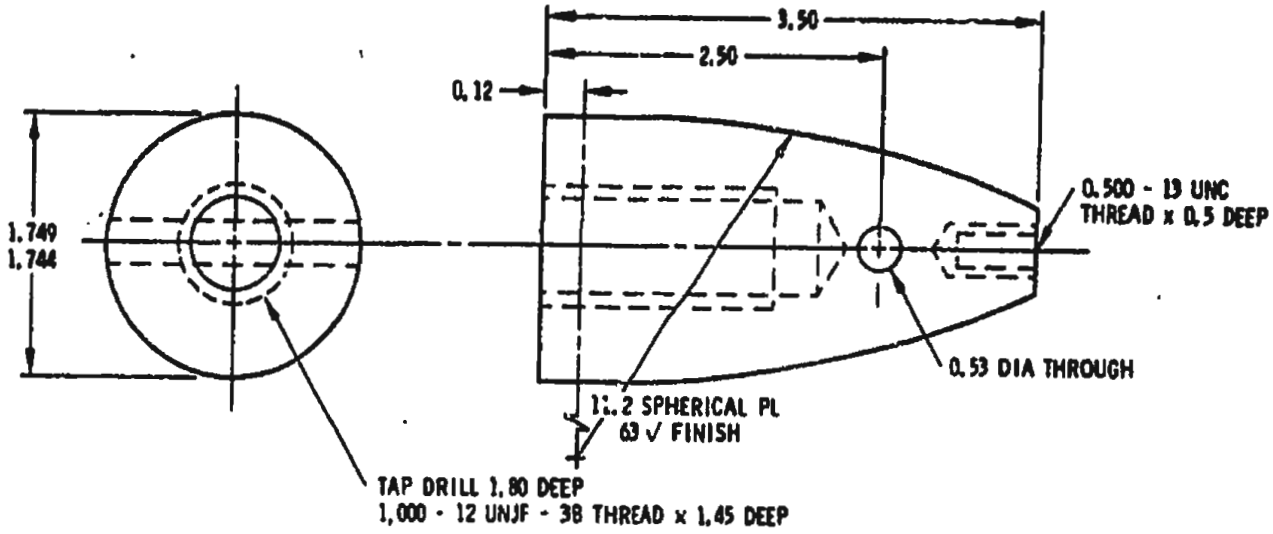
1 ALL DIMENSIONS IN INCHES
2 MATERIAL: 4130 STEEL
3 HEAT TREAT: 160,000 - 180,000 PSI

BULLET-AFT DRAG STRUT WING PYLON
LOCAL MANUFACTURE

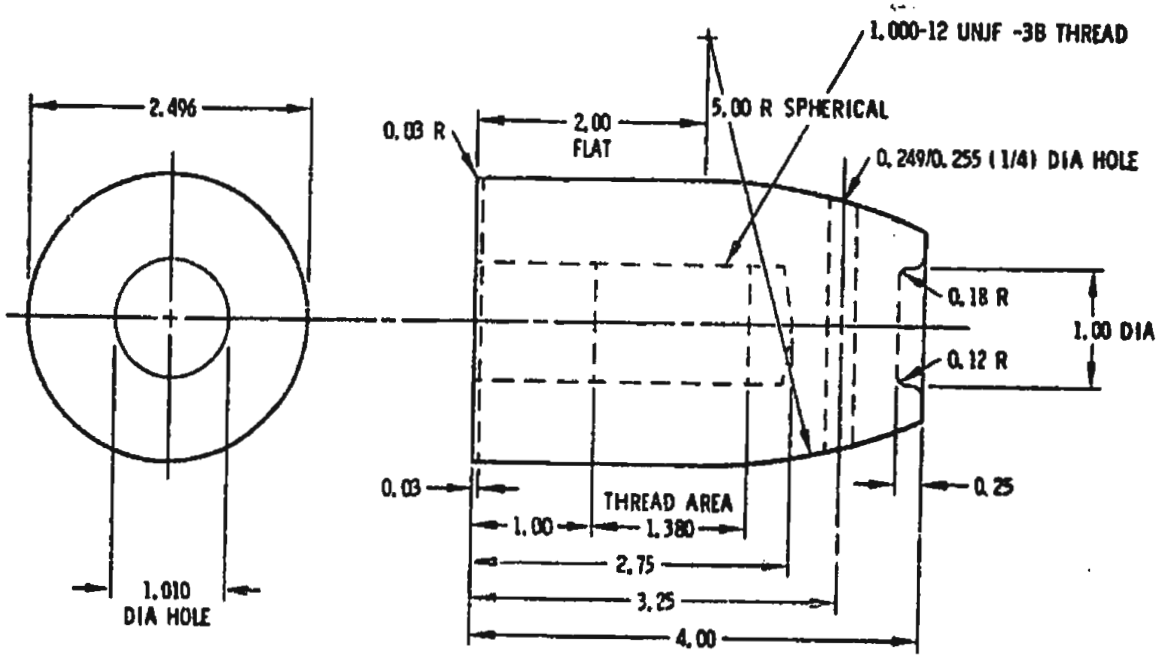


R Aft Drag Strut Bolt Removal Tool and Nylon Strapping Attachments
R Figure 405

R EFFECTIVITY: ALL
R
001B



BULLET-DRAG STRUT FORWARD LUG TO PYLON BOX BOLT
LOCAL MANUFACTURE



BULLET-PYLON TO WING SUPPORT FITTING BOLT
LOCAL MANUFACTURE

NOTE

1 ALL DIMENSIONS IN INCHES
2 MATERIAL: STEEL
3 HEAT TREAT: 160,000 TO 180,000 PSI

M1-0000-54-088

R Forward Drag Strut and Pylon to Wing Support Fitting Bolt Removal
R and Installation Tool
R Figure 406

R EFFECTIVITY: ALL
R
001B

WING PYLON BOX STRUCTURE - DESCRIPTION AND OPERATION

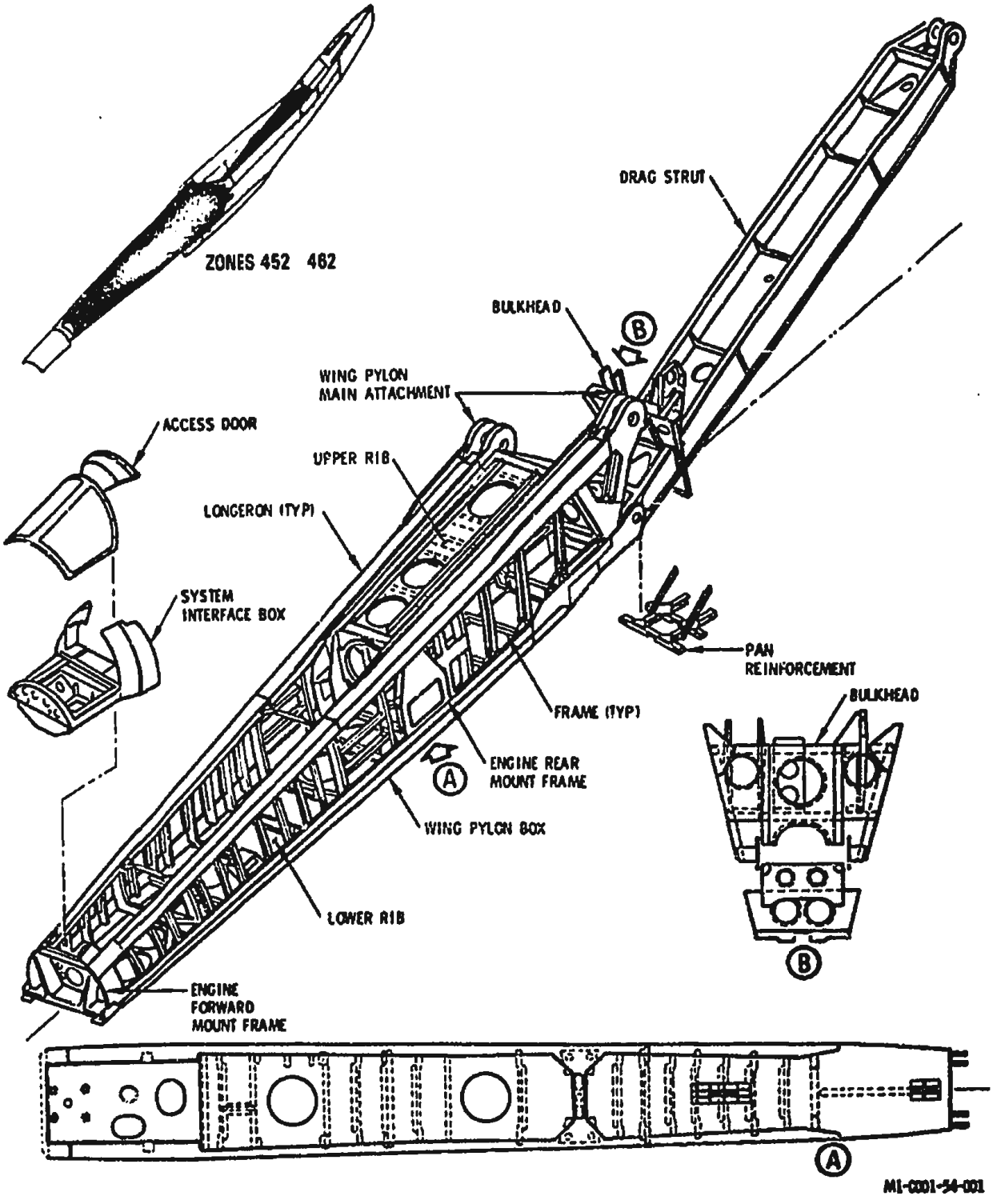
1. General

The pylon main frame (Ref. Fig. 1) is a box structure of machined titanium longerons, frames, intercostals, fittings, webbed ribs, and tie-rods. All pylon materials are fire-resistant.

The upper and lower longerons are welded segments of titanium extrusion which are machined to contour. The pylon forward and aft engine mount frames, and the main frames at PS 123.80, 166.50, and 232.30 are machined from titanium forgings or plate. Formers at PS 202.00, 211.00, and 220.70 have side members machined from titanium forgings, with upper and lower members made of titanium sheet. The remaining frames are made of formed titanium sheet metal. Intercostals are made of titanium sheet and extruded shapes. Two stiffened web ribs are located horizontally between the two upper and two lower longerons. The ribs are made of titanium. The lower rib serves as a fire stop bulkhead between the engine nacelle and pylon. The forward end of the lower rib is machined from 0.5-inch titanium plate.

Access to the engine mount fittings is provided through access panels at PS 190, and through the forward leading edge panel aft of PS 99.60. The aft nose panel provides access to the systems interface box assembly forward of PS 99.60.

The drag strut is a machined forging of cadmium plated 4340 steel. The drag-strut weighs approximately 380 pounds and is attached at the rear lower attachment fitting of the main frame PS 255.35. The drag strut fitting attaches to the wing at PS 358.30.



R
R

Wing Pylon Structure
Figure 1

EFFECTIVITY: ALL

0018

WING PYLON BOX STRUCTURE - REMOVAL AND INSTALLATION

1. General

This procedure is applicable for the left and right pylons.

R NOTE: Brass washers shown in Figure 404 need not be replaced if
R they are being extruded from their normal position.
R Deterioration of brass washer is normal, however, if
R washer wears thru and bolt head of steel washer is
R scrubbing on fitting, washer should be replaced at engine
R change or a prior convenient opportunity.

2. Equipment and Materials

Pylon Tool Set, BG35 (G/ITEL), or equivalent

Engine Pylon Loader Bar (G/ITEL, 54-11-02), or equivalent

Forward Drag Strut Bolt Remover (G/ITEL, 54-11-04), or equivalent

Pylon Bolt Installation/Removal Tool Kit (G/ITEL, 54-11-05), or equivalent

Sealant - PR 7301 or 7401, Type I or II; Products Research Co., or equivalent

Sealant - MIL-S-22473, Grade H, or equivalent

Cleaner - 1, 1, 1, Trichloroethane (MIL-T-81533), or equivalent

Grease - General Aircraft MIL-G-23827, or equivalent

3. Referenced Procedures

6-40-00	Exterior Access Doors and Panels - Description and Operation
12-26-02	Wing Pylon Attach Fittings Lubrication, Figure 301
20-24-04	Electric Bonding and Grounding Connections
20-36-02	Double T-Bolt V-Band coupling - Removal and Installation
20-51-01	Bolts and Screws - Maintenance Practices

28-20-01	WIG-O-FLEX Couplings - Maintenance Practices
28-24-07	Engine Firewall Shutoff Valve, Engine No. 1 or 3 - Removal and Installation
36-11-00	Engine Bleed Air System - Description and Operation
54-24-01	Wing Pylon Trailing Edge Assembly - Removal and Installation
54-51-53	Diverter Fairing - Removal and Installation
54-51-55	Skirt Fairing - Removal and Installation
54-51-56	Trailing Edge Wedge Fairing - Removal and Installation
71-00-01	Wing Mounted QEC Unit - Removal and Installation

4. Removal/Installation

NOTE: Install protective caps on all open fuel, hydraulic and ventilation lines and fittings; and electrical connectors, plugs, and accessory units.

Cap or seal, as appropriate, open bleed air ducts.

Coil and stow all electrical harnesses at wing leading edge area.

A. Removal

(1) Remove applicable wing mounted QEC unit (Ref. 71-00-01).

(2) Remove trailing edge wedge fairing (Ref. 54-51-56).

(3) Remove wing pylon trailing edge assembly (Ref. 54-24-01).

(4) Remove skirt fairing (Ref. 54-51-55).

(5) Remove diverter fairing (Ref. 54-51-53).

(6) On pilots overhead panel, zone 210, verify applicable engine firewall fuel and hydraulic shutoff valves are closed.

(7) On pilots overhead circuit breaker panel CB1, zone 210, verify following circuit breakers are opened and tagged.

FIRE EXTINGUISHER MAIN and ALTN (C10 and C11, or C14 and C15)

THRUST REVERSE (H16 or H18)

FUEL SHUTOFF VALVE-TANK-ENG 1 (D10) or ENG 3 (D12)

HYD PUMP & FIREWALL SHUTOFF VALVE CONT SYS A (L15) or SYS B (L18)

(8) Verify aircraft is properly grounded and landing gear safety pins are installed.

(9) Verify tank fuel shutoff valve is in closed position.

(10) Drain fuel from fuel line between tank shutoff valve and pylon firewall shutoff valve, by holding suitable bucket or container under fuel line below pylon shutoff valve and manually opening valve (Ref. Fig. 401 and 28-24-07).

NOTE: Manually close pylon firewall shutoff valve following drainage of fuel line.

(11) Disconnect fuel line coupling gravity drain line at pylon-to-wing connection.

(12) Disconnect fuel line coupling at wing interface (Ref. Fig. 401 and 28-20-01).

(13) Disconnect bleed air duct at wing connection (Ref. Fig. 401 and 20-36-02).

(14) Disconnect three hydraulic tubes at wing bulkhead fittings, immediately aft of PS 400 (Ref. Fig. 402).

(15) Disconnect support clamps from brackets at five places between aft end of drag strut, PS 360, and PS 400. Retain all parts for reinstallation.

(16) In area of pylon box attachment to wing fittings (approximately PS 250) disconnect three hose assemblies at point of connection with pylon box rigid tubing.

NOTE: Tie back or support flexible hose assemblies as required.

(17) Disconnect electrical connections to hydraulic system high pressure and case drain filters, and hydraulic system firewall shutoff valve, located onbracket attached to drag strut between PS 260 and PS 280.

(18) Remove access doors 511KB and 511LB, or 611KB and 611LB on underside of wing leading edge to gain access to throttle cable disconnects (Ref. 6-40-00).

(19) Disconnect throttle cables at two places.

NOTE: Access is gained through access openings (511KB and 511LB) on underside of wing leading edge (Ref. 6-40-00).

(20) Disconnect pylon ventilation system tubing forward of PS 218 (Ref. Fig. 403).

NOTE: Discard removed O-ring seal and install new seal at time of installation.

(21) Remove all electrical wire harnesses from pylon box assembly by disconnecting wiring from all electrically operated units and disconnecting bulkhead connectors at interface box and firewall. Disconnect all wiring support clamps and open covers to harness support troughs. Remove bleed air duct sections as required to gain access to connectors and support clamps. Coil and stow wire harnesses in area of wing leading edge.

NOTE: To facilitate reinstallation of harnesses, identify and tag all wiring as to routing, location, unit or connector to which attached, etc.

(22) Disconnect two bonding jumpers from brackets, located on each side of pylon, just forward of pylon-to-wing attachment fittings (Ref. Fig. 404).

(23) Using tools from BG35 pylon tool set (socket, universal, extension bar and wrench), remove nuts and washers from bolts at pylon main attachment fittings (inboard and outboard) and at drag strut aft attachment fitting (Ref. Fig. 404).

NOTE: To assure that the proper shims and washers are reinstalled in the proper location and position, identify and tag as these parts are removed.

(24) Using tools from BG35 pylon tool set (socket, universal and extension bar) and standard 2-inch open-end wrench to hold bolt head, loosen nuts of bolts at drag strut forward attachment fittings (inboard and outboard).

(25) Attach engine pylon load bar and torque cell, or equivalent type of support cradle assembly, to overhead

crane and position under pylon and drag strut (Ref. G/ITEL, 54-11-02).

(26) Raise lift bar, or equivalent cradle, enough to relieve load on pylon and drag strut attachment bolts (approximately 2000 pounds).

NOTE: To determine when load on attachment bolts is relieved, use wrench (BG35 tool set) to turn bolts enough to note ease of rotation and freedom from binding.

(27) Using driver and rivet gun from BG35 tool set and locally fabricated bullet (Ref. Fig. 405), remove drag strut aft attachment bolt.

NOTE: Identify and tag washers to assure reinstallation at proper location and position. The drag strut must be properly supported before attempting to remove the bolt.

(28) Using bullet from BG35 tool set and tool kit (G/ITEL, 54-11-05), remove pylon-to-wing attachment bolts.

(29) Lower pylon and drag strut to floor.

(30) If separation of drag strut from pylon box structure is not required, stow removed assembly as required.

(31) If separation of drag strut from pylon box structure is required, proceed as follows:

(a) Remove loosened nuts and washers.

(b) Using bullet (Ref. Fig. 406) in conjunction with G/ITEL 54-11-04 and 54-11-05, remove drag strut forward attachment bolts (2 places).

NOTE: Drag strut assembly must be properly supported as bolts are removed. Remove and stow drag strut as required.

Refer to G/ITEL, 55-11-05 for suggested hard points locations on engine pylon load bar, G/ITEL, 54-11-02.

(32) Stow pylon as required.

B. Installation

NOTE: Prior to installation of all attachment bolts, apply thin coating of general aircraft grease

(MIL-G-23827) or equivalent to internal surface of bushing/bearings, bearing surface of bolts and exterior surface of tool kit bullets.

(1) On pilots overhead panel, zone 210, verify applicable engine firewall fuel and hydraulic shutoff valves are closed.

(2) On pilots overhead circuit breaker panel CB1, zone 210, verify following circuit breakers are opened and tagged:

FIRE EXTINGUISHER MAIN and ALTN (C10 and C11, or C14 and C15)

THRUST REVERSE (H16 or H18)

FUEL SHUTOFF VALVE-TANK-ENG 1 (D10) or ENG 3 (D12)

HYD PUMP & FIREWALL SHUTOFF VALVE CONT SYS A (L15) or SYS B (L18)

(3) Verify aircraft is properly grounded and landing gear safety pins are installed.

(4) Check all attach point bushings in drag strut, pylon box structure and wing forward and aft fittings for wear and general condition (Ref. Structural Repair Manual 54-11-00). Replace bushings as required.

(5) Flush lubrication holes of all attachment bolts with solvent.

(6) Check all attachment bolts for wear, scoring and general condition (Ref. Structural Repair Manual 54-11-00). Replace as required.

(7) If drag strut was removed from pylon box structure, reinstall as follows:

NOTE: For location of specific type and thickness of washers at these two locations, refer to Figure 404, View C.

(a) Install brass washer on each attachment bolt next to head and screw bolt into flat end of bullet (Ref. Fig. 406). Using hydraulic press (G/ITEL, 54-11-05) and with washers in proper location and position, press bolt until washer and bolt head is bottomed.

(b) On threaded end of bolt install brass washer, steel washer and nut. Do not tighten nut.

(c) Install bolt and washers on opposite side in same manner. Do not tighten nut.

(8) With overhead hoist, raise and move pylon and drag strut assembly into position for attachment to wing fittings.

NOTE: For location of specific type and thickness of washers at these two locations, refer to Figure 404, View B.

(9) Install washer next to bolt head and screw bolt into bullet (Ref. Fig. 406).

(10) Using hydraulic press (G/ITEL, 54-11-05), press bolt into fitting. Install all washers in correct position and location between surfaces of wing and pylon box fittings.

(11) On threaded side of bolt (inner side) perform following:

CAUTION: STEEL WASHER IS CHAMFERED AND ONE SIDE IS CUT OFF (FLAT), CUT OFF AREA HAS INCREASED CHAMFER. CHAMFERED EDGE OF CUT OFF SIDE OF WASHER MUST NEST IN RADIUS OF FITTING.

(a) Install three washers and verify chamfered edge of cut off side of steel washer nests in radius of fitting.

(b) Install shear nut. Do not tighten nut.

(12) Install opposite bolt in same manner. Do not tighten nut.

(13) At drag strut aft attachment, install brass washer next to head of bolt and screw bolt into locally fabricated bullet (Ref. Figs. 404, View D and 405).

NOTE: Align inner race of bearing in wing fitting prior to installation of bolt.

(14) Using driver and rivet gun from BG35 tool set, drive bolt through drag strut and bearing in wing fitting.

NOTE: Use protective material between bolt head and driver, while driving bolt to bottomed position.

(15) On threaded side of bolt, install steel washer, followed by brass washer and nut. Cut off side faces down and nests in radius of fitting.

(16) With wrench on bolt head to prevent turning, torque nut to 550 to 650 pound feet.

(17) With wrench on bolt heads to prevent turning, tighten pylon to wing support fitting shear nuts to a torque of 1400 to 1500 pound inches and verify clearance of 0.002 to 0.018 inch exists between washer and lug face (Ref. Fig. 407).

NOTE: Clearance of 0.002 to 0.018 inch required between washer and lug face.

(18) With wrench on bolt heads to prevent turning tighten drag strut forward lugs to pylon shear nuts to a torque of 1400 to 1500 pound inches.

(19) Lower and remove engine pylon load bar, or equivalent type of support cradle assembly, from pylon and drag strut. Stow as required and detach from overhead crane.

(20) Reinstall all electrical harnesses, following identifying instruction on tags, etc. Reconnect all harness support clamps and brackets; attach leads to electrical units or accessories, secure trough covers and reconnect harness disconnects at bulkhead connectors located at interface box and firewall.

(21) Reconnect two bonding jumpers to brackets, located on each side of pylon just forward of pylon-to-wing attachment fittings (Ref. Fig. 404).

NOTE: Clean bonding surfaces before installing bolts and washers (Ref. 20-24-04).

(22) Apply sealant, PR 7301 or PR 7401, Type I or II (Ref. 20-24-04).

(23) Reinstall all bleed air ducts which were removed to gain access to electrical harness fittings and supports (Ref. 20-36-02).

(24) Using a new O-ring seal, reconnect pylon ventilation system tube, forward of PS 218 (Ref. Fig. 403).

(25) Reconnect throttle cables at two places in forward wing area.

NOTE: Access is gained through access door openings (511KB and 511LB) on underside of wing leading edge (Ref. 6-40-00).

(26) Reconnect electrical connections to hydraulic system high pressure filter, case drain filter and firewall shutoff valve; located on bracketry attached to drag strut between PS 260 and PS 280.

(27) At approximately PS 250, reconnect three hydraulic hose assemblies to tubing in pylon box assembly (Ref. Fig. 402).

(28) Reconnect three hydraulic tubes at wing bulkhead fittings, immediately aft of PS 400.

(29) Reconnect supports for hydraulic tubes at five locations, between PS 360 and PS 400.

(30) Reconnect bleed air ducting at wing connection (Ref. Fig. 401 and 20-36-02).

(31) Reconnect fuel line coupling at wing interface (Ref. Fig. 401 and 28-20-01).

(32) Reconnect fuel line coupling gravity drain line at pylon-to-wing connection.

(33) Reinstall diverter fairing (Ref. 54-51-53).

(34) Reinstall skirt fairing (Ref. 54-51-55).

(35) Reinstall wing pylon trailing edge assembly (Ref. 54-24-01).

(36) Reinstall trailing edge wedge fairing (Ref. 54-51-56).

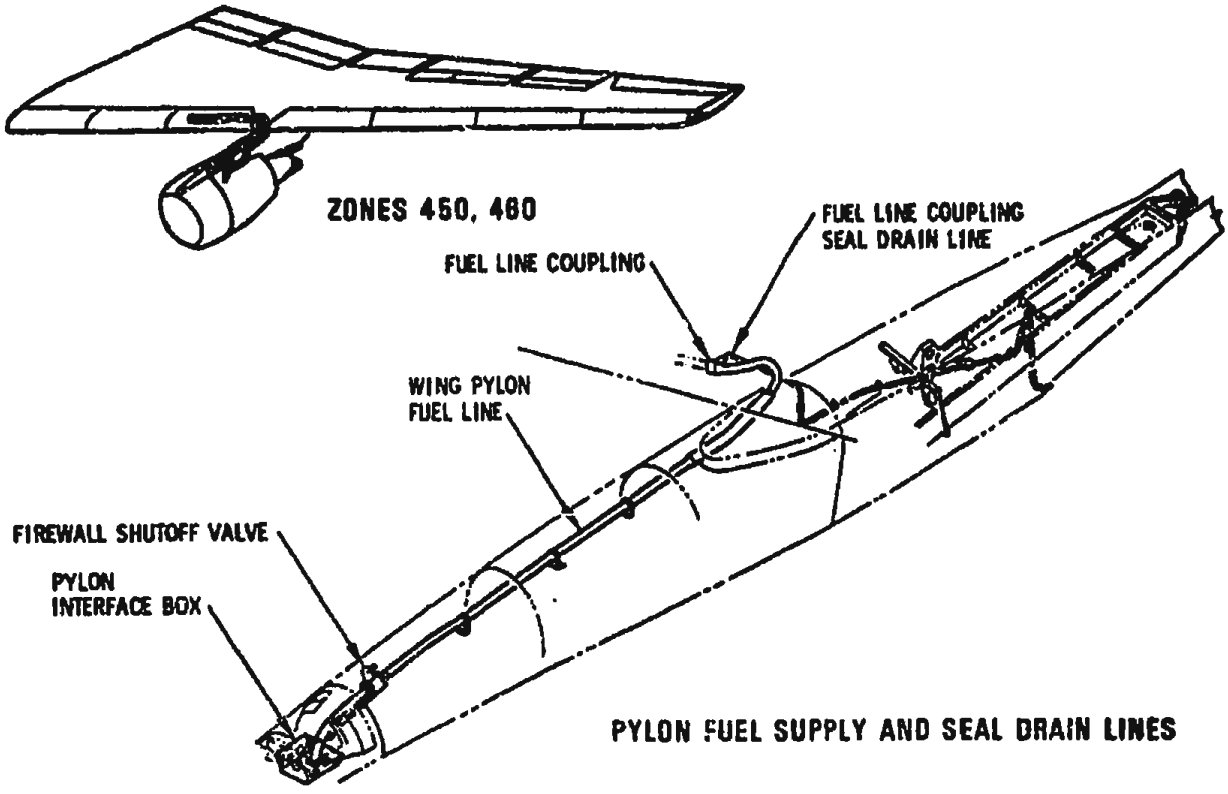
(37) Reinstall applicable wing mounted QEC unit (Ref. 71-00-01).

(38) Lubricate all pylon and drag strut attachments (Ref. 12-26-02).

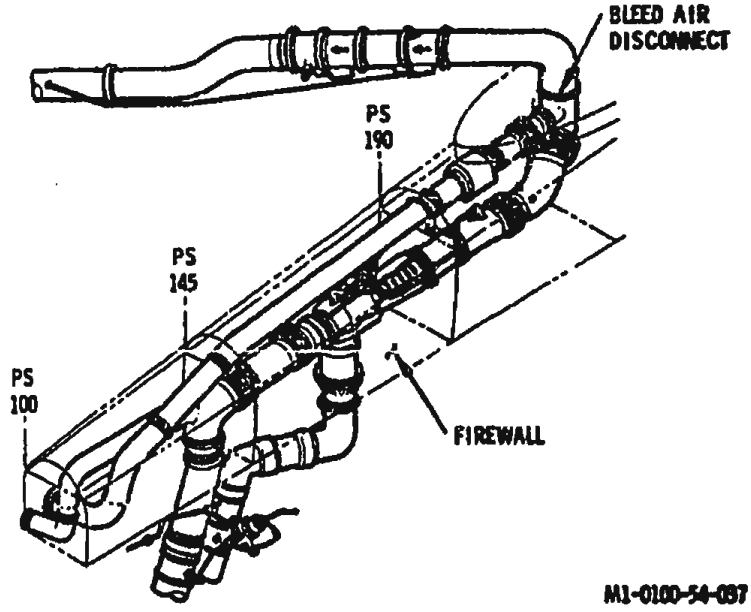
C. Engine Mount Bushings

(1) Removal

NOTE: The engine mount bushings in the forward and aft fittings of the wing pylon box structure can be replaced with pylon installed or removed. In either case the bushings are accessible and special tools are not required.



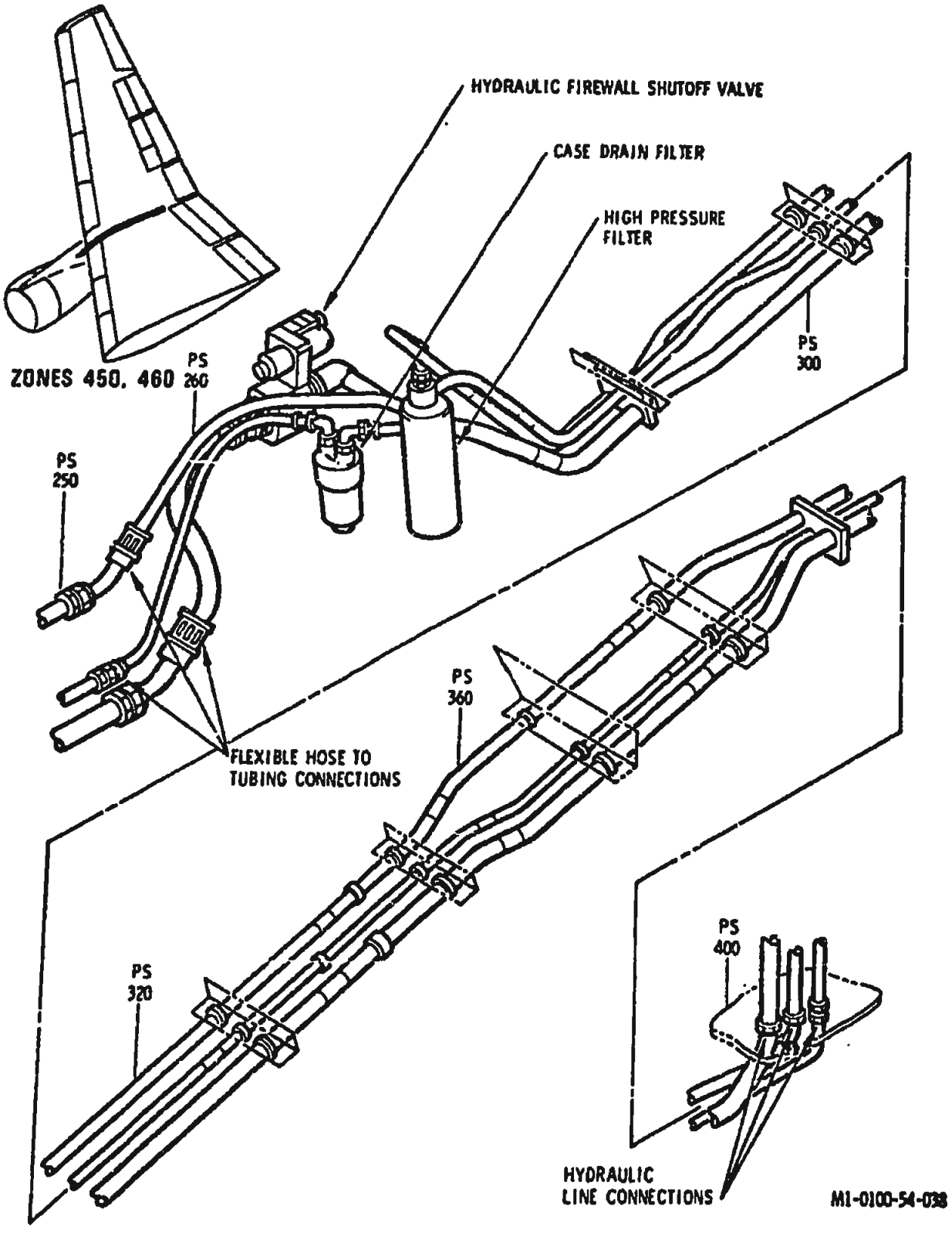
PYLON FUEL SUPPLY AND SEAL DRAIN LINES



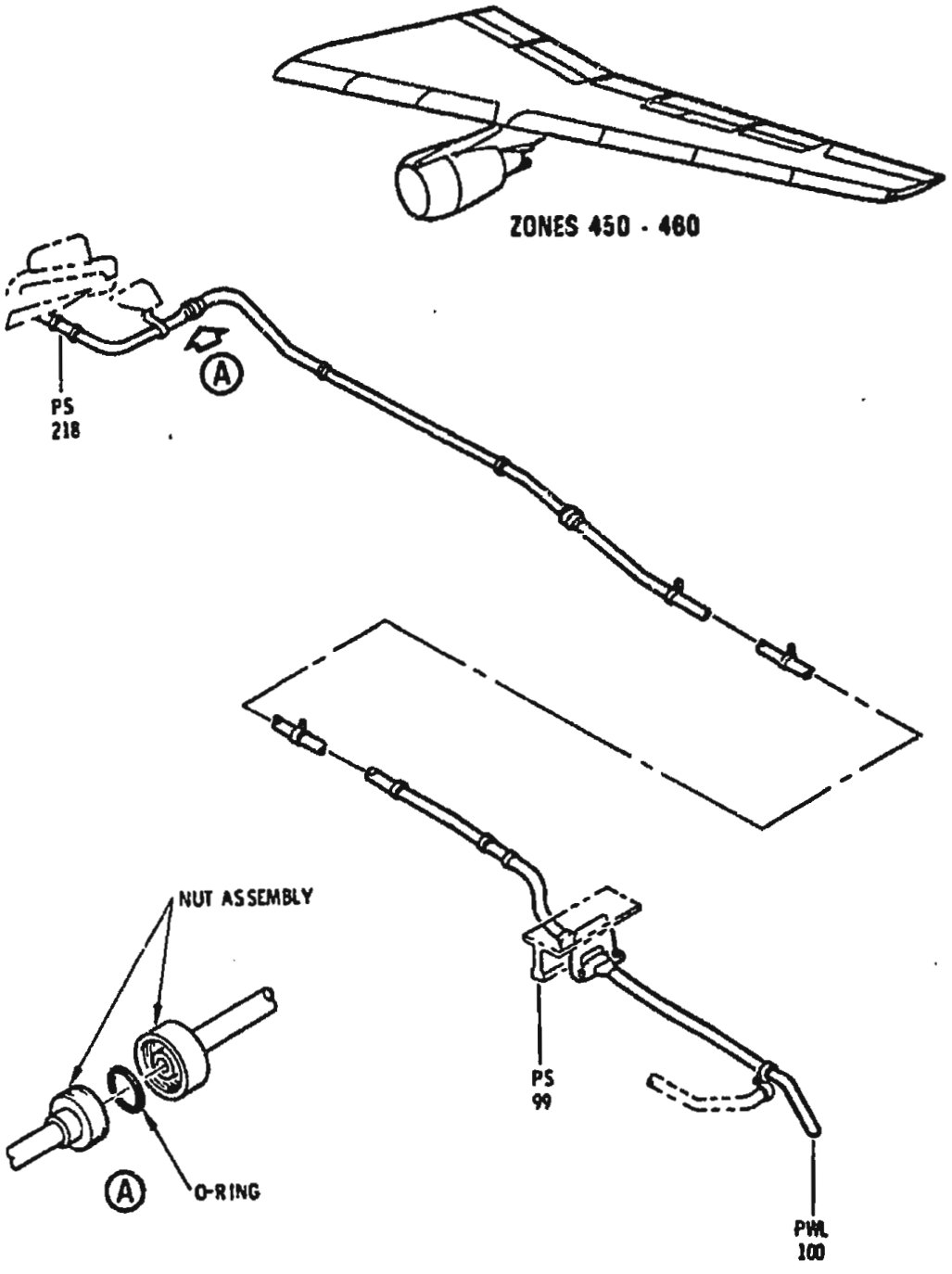
PYLON BLEED AIR SUPPLY DUCTING

R Wing Pylon Bleed Air and Fuel System Disconnect Locations
R Figure 401

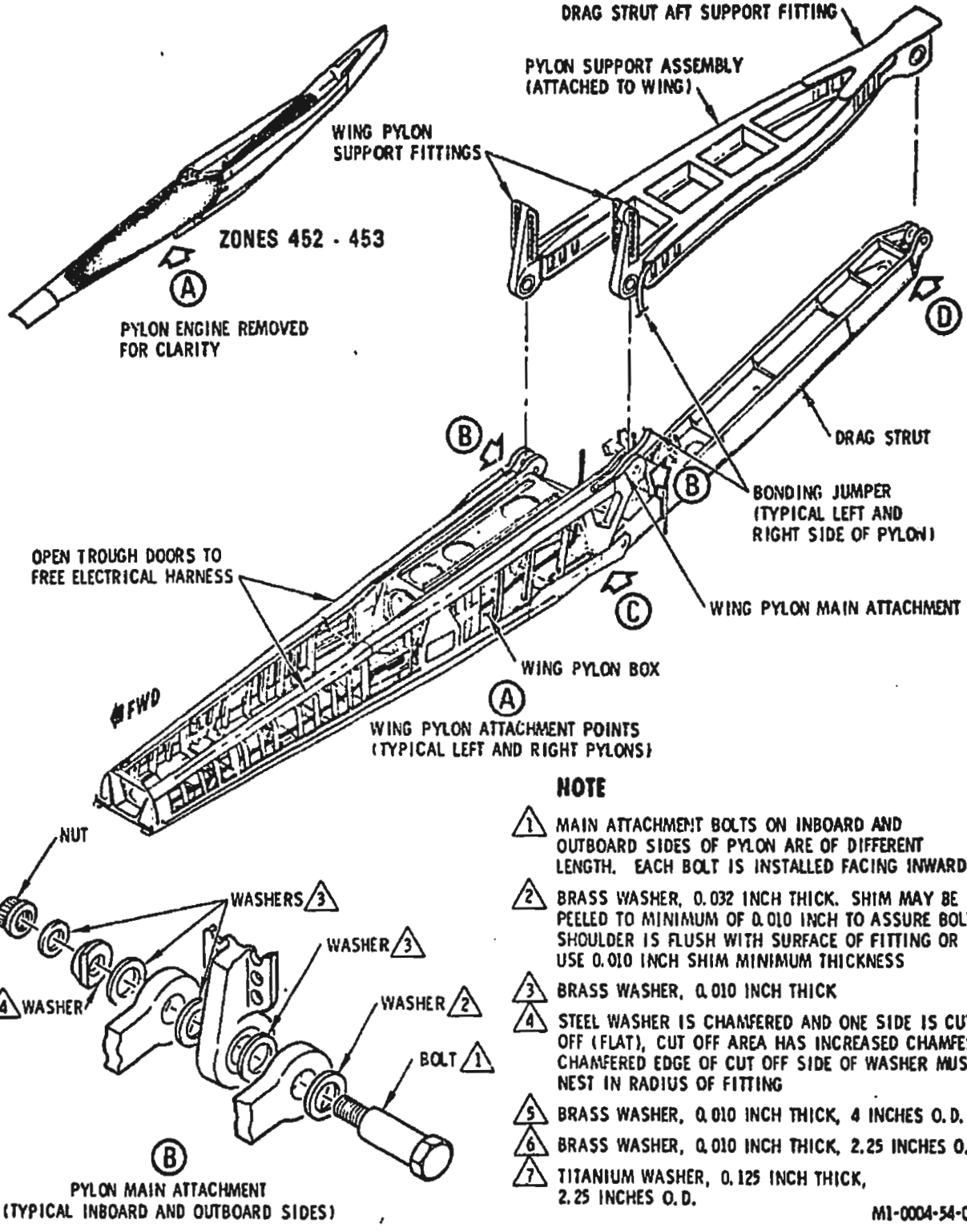
R EFFECTIVITY: ALL
R
001B



Wing Pylon Hydraulic System Disconnect Locations
Figure 402



R Wing Pylon Ventilation System Disconnect Location
R Figure 403



NOTE

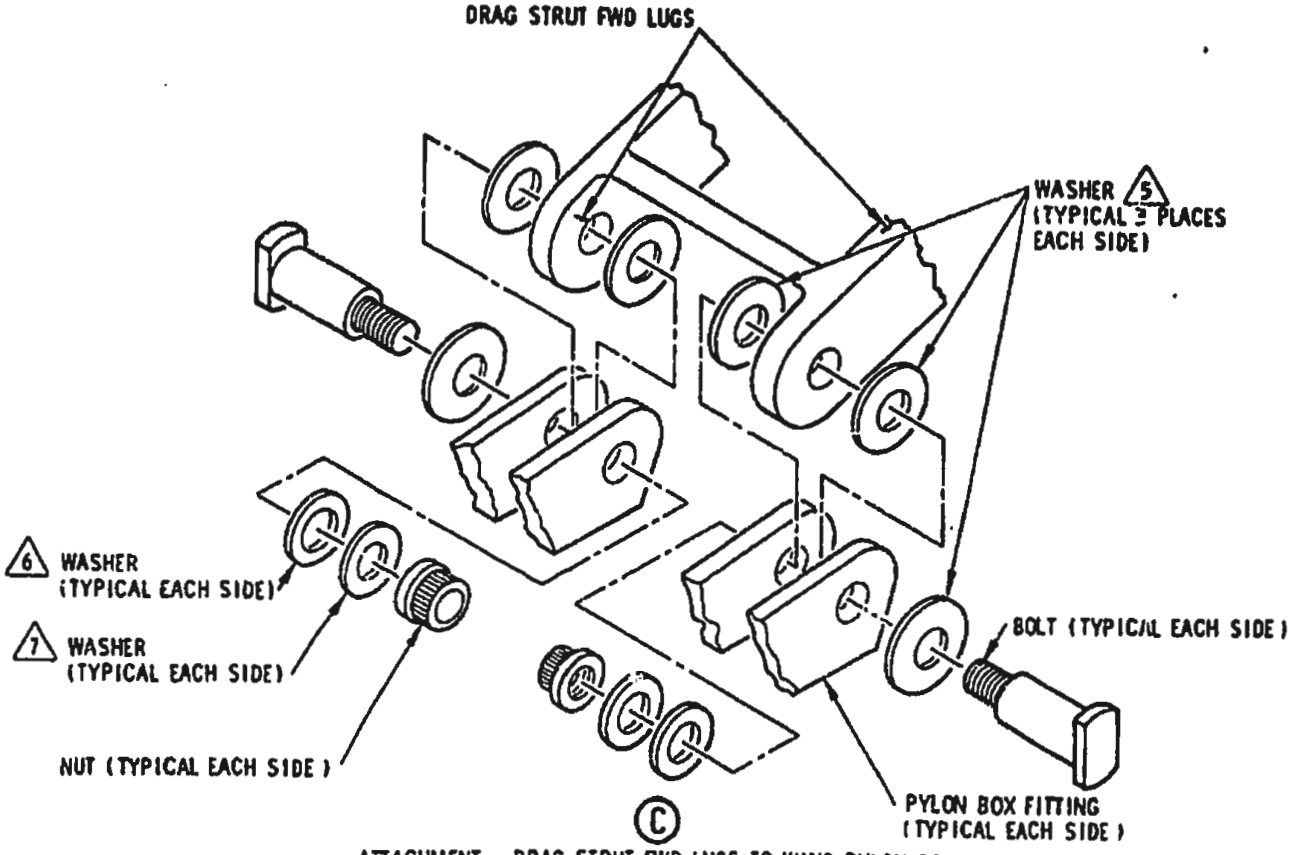
1. MAIN ATTACHMENT BOLTS ON INBOARD AND OUTBOARD SIDES OF PYLON ARE OF DIFFERENT LENGTH. EACH BOLT IS INSTALLED FACING INWARD
2. BRASS WASHER, 0.032 INCH THICK. SHIM MAY BE PEELED TO MINIMUM OF 0.010 INCH TO ASSURE BOLT SHOULDER IS FLUSH WITH SURFACE OF FITTING OR USE 0.010 INCH SHIM MINIMUM THICKNESS
3. BRASS WASHER, 0.010 INCH THICK
4. STEEL WASHER IS CHAMFERED AND ONE SIDE IS CUT OFF (FLAT), CUT OFF AREA HAS INCREASED CHAMFER. CHAMFERED EDGE OF CUT OFF SIDE OF WASHER MUST NEST IN RADIUS OF FITTING
5. BRASS WASHER, 0.010 INCH THICK, 4 INCHES O.D.
6. BRASS WASHER, 0.010 INCH THICK, 2.25 INCHES O.D.
7. TITANIUM WASHER, 0.125 INCH THICK, 2.25 INCHES O.D.

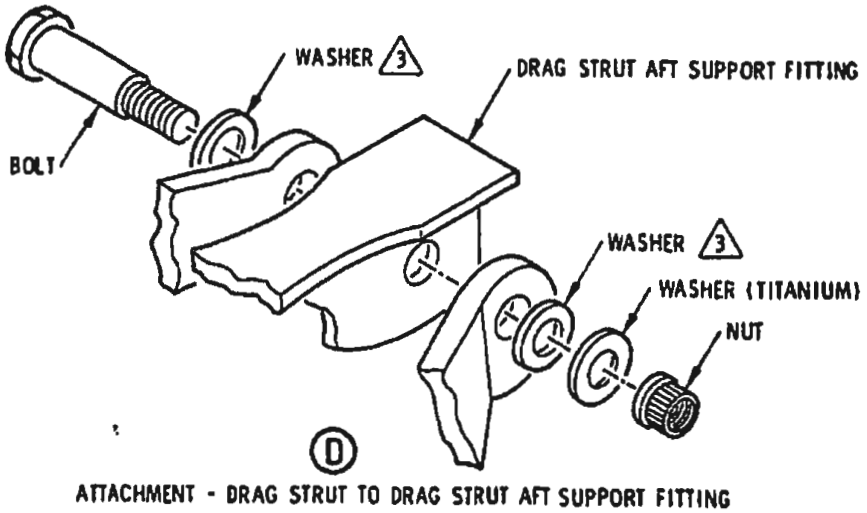
M1-0004-54-040

R Wing Pylon Box Structure and Drag Strut - Removal and Installation
R Figure 404 (Sheet 1)

EFFECTIVITY: ALL

001B


DRAG STRUT FWD LUGS
WASHER 5 (TYPICAL 2 PLACES EACH SIDE)
6 WASHER (TYPICAL EACH SIDE)
7 WASHER (TYPICAL EACH SIDE)
NUT (TYPICAL EACH SIDE)
BOLT (TYPICAL EACH SIDE)
PYLON BOX FITTING (TYPICAL EACH SIDE)
C
ATTACHMENT - DRAG STRUT FWD LUGS TO WING PYLON BOX



M1-0004-54-041

R Wing Pylon Box Structure and Drag Strut - Removal and Installation
R Figure 404 (Sheet 2)

(a) At aft mount fitting, push each of four bushings (two on each side) upward and lift from fitting hole (Ref. Fig. 408).

NOTE: If more than thumb force is required to move the bushing, use soft drift and tap lightly.

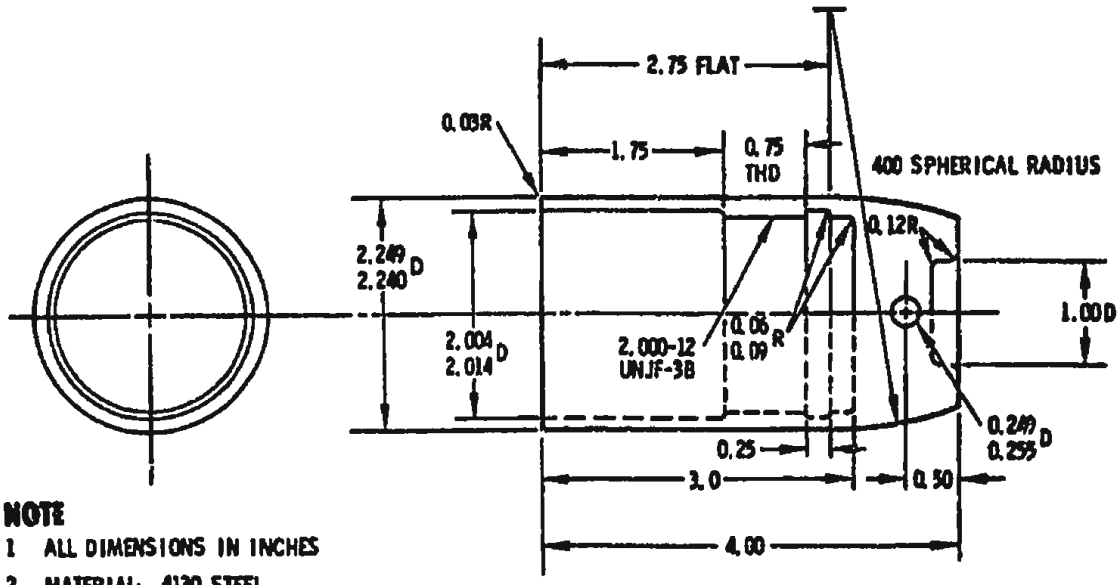
(b) At forward mount fitting, follow same procedure as performed in Step (a).

(2) Installation

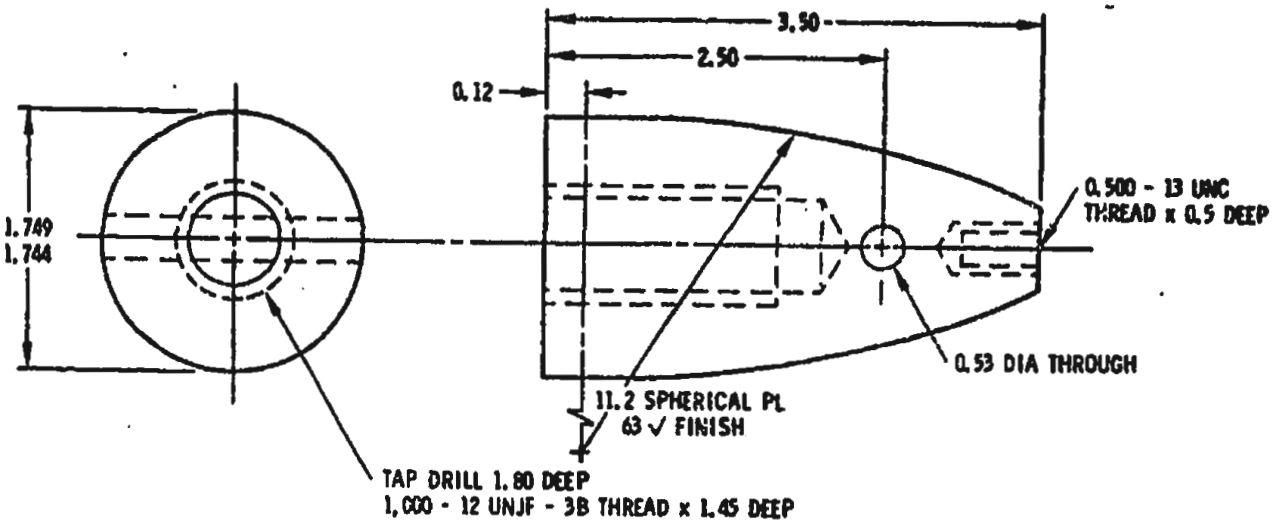
(a) At each mount fitting, clean sealant from all bushing holes and from area on top side which contacts bushing flange.

NOTE: Use clean cloth dampened with 1, 1, 1, Trichloroethane (MIL-T-81533), or equivalent. Wipe dry with clean dry cloths and permit to dry for minimum of 10 minutes prior to application of sealant.

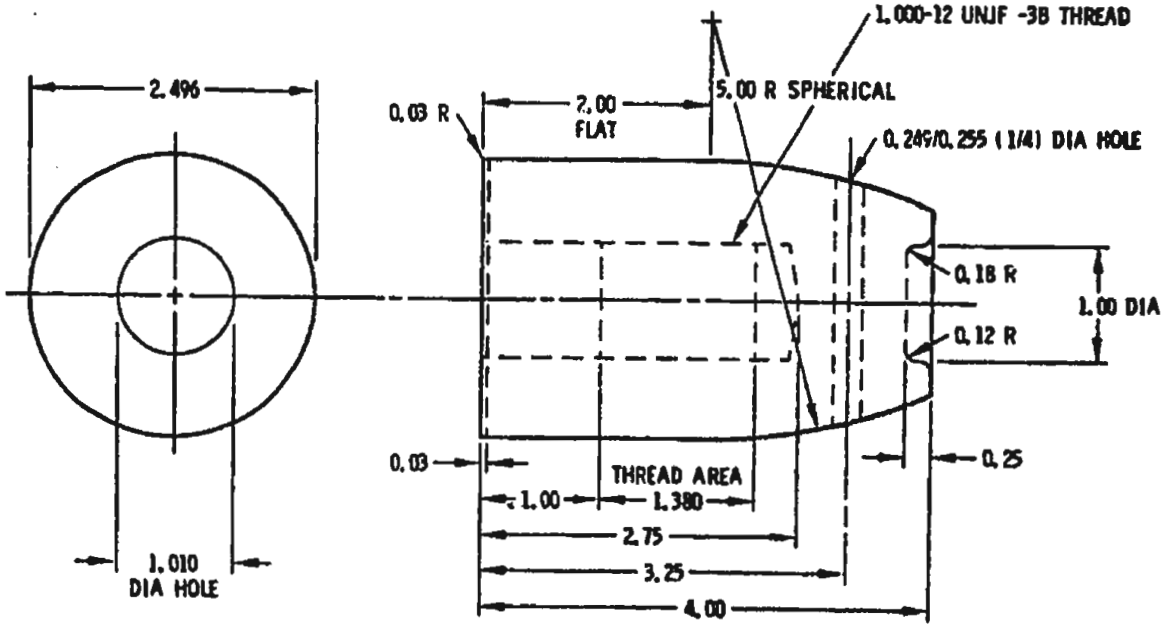
(b) At aft mount fitting, install four new bushings (two on each side) and press downward until flange is in firm contact with fitting (Ref. Fig. 408).



Aft Drag Strut Bolt Removal Tool
Figure 405



BULLET-DRAG STRUT FORWARD LUG TO PYLON BOX BOLT
. LOCAL MANUFACTURE



BULLET-PYLON TO WING SUPPORT FITTING BOLT
LOCAL MANUFACTURE

NOTE

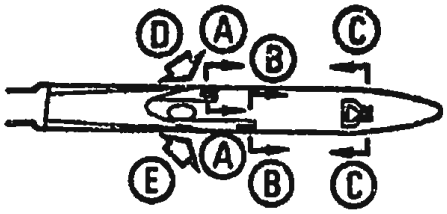
1 ALL DIMENSIONS IN INCHES
2 MATERIAL: STEEL
3 HEAT TREAT: 160,000 TO 180,000 PSI

MI-0000-54-088

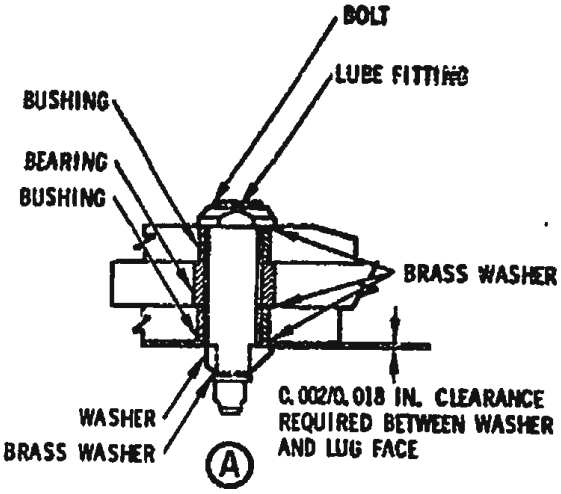
R Forward Drag Strut and Pylon to Wing Support Fitting Bolt
R Removal and Installation Tool
R Figure 406

EFFECTIVITY: ALL

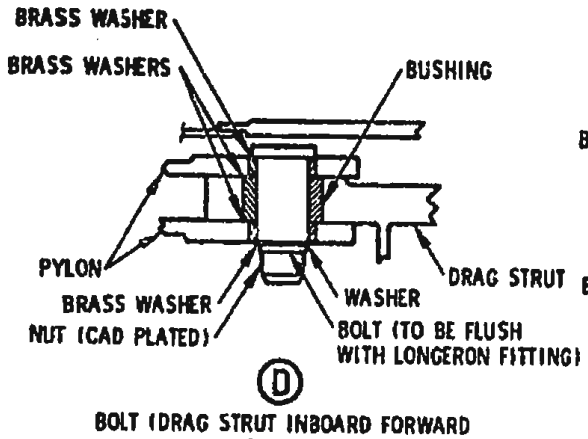
001B



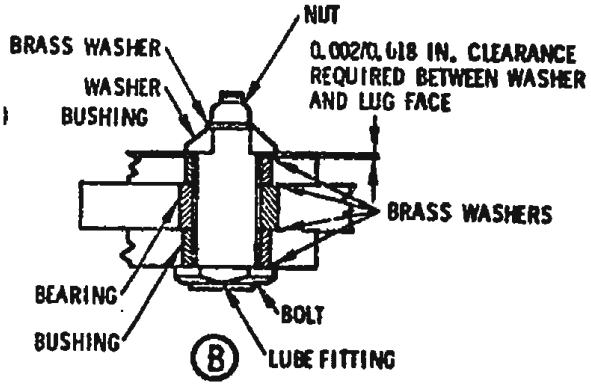
LH PYLON - (VIEW LOOKING DOWN VIEW D AND E NOT SHOWN)



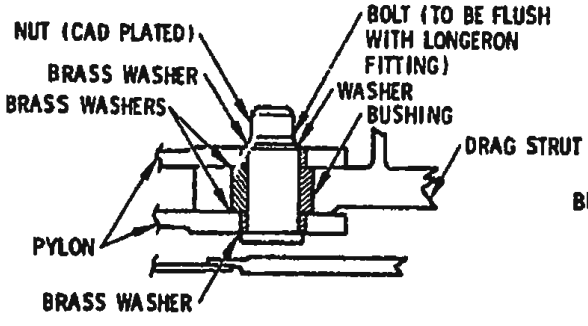
BOLT (UPPER INBOARD PYLON TO WING SPAR SUPPORT FITTING)



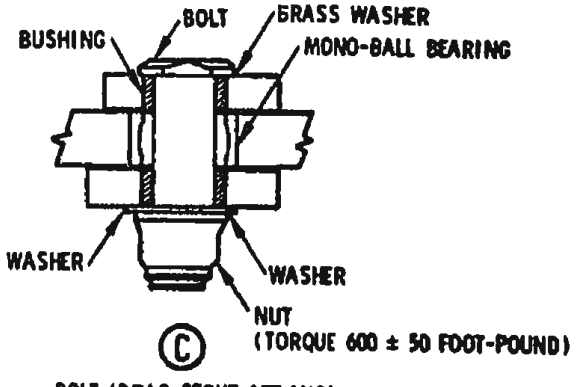
BOLT (DRAG STRUT INBOARD FORWARD LUG TO PYLON)



BOLT (UPPER OUTBOARD PYLON TO WING SPAR SUPPORT FITTING)



BOLT (DRAG STRUT OUTBOARD FORWARD LUG TO PYLON)



BOLT (DRAG STRUT AFT LUG)

M1-0003-54-070

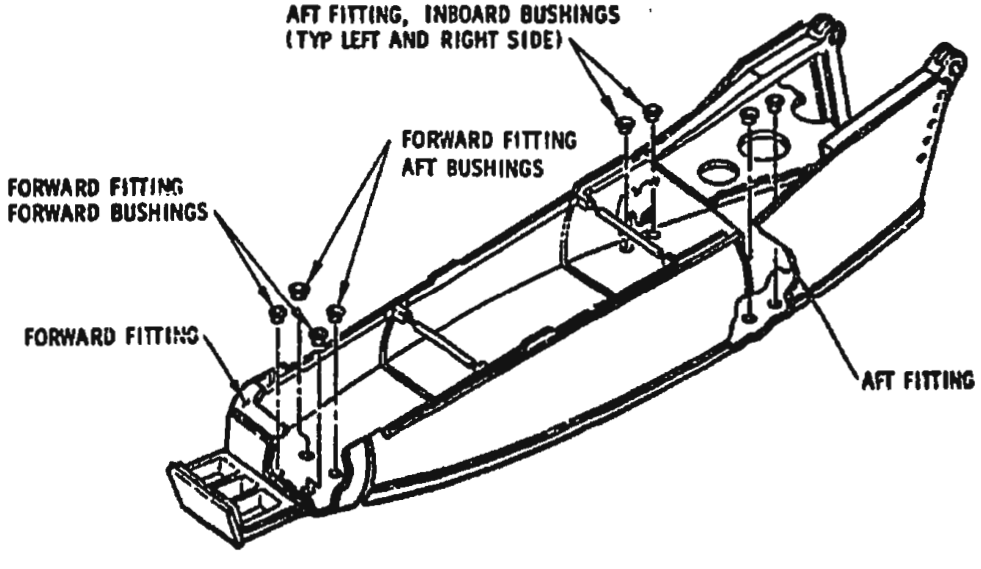
R Pylon Bolt Assembly
R Figure 407

R EFFECTIVITY: ALL
R
001B

NOTE: Prior to installation of each bushing, apply thin coating of sealant (MIL-S-22473, Grade H), or equivalent to bushing O.D. and on flange surface that seats on fitting. Verify bushing is firmly seated and remove excess sealant.

(c) At forward mount fitting, follow same procedure performed in Step 4C(2)(b).

NOTE: The four bushings at the forward mount fitting are not identical. The two bushings at forward location have much thicker flanges than aft bushings and have a greater overall length. Verify correct bushings are installed at the proper locations.



Pylon Engine Mount Bushings - Removal and Installation
Figure 408

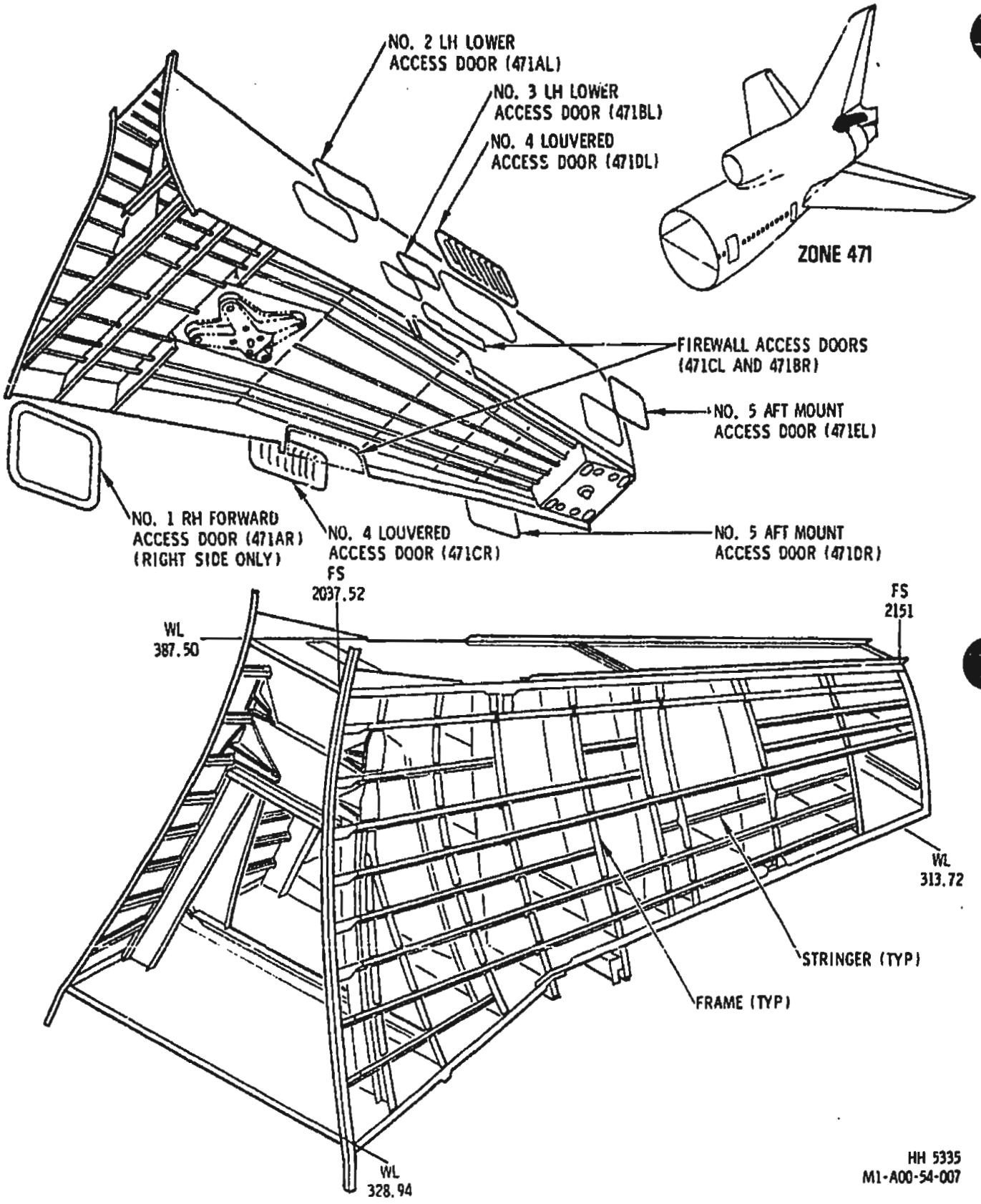
CENTER ENGINE SUPPORT STRUCTURE - DESCRIPTION AND OPERATION

1. General

The NO. 2 engine (center engine) is mounted on the center engine support structure (Ref. Fig. 1). The forward end of the center engine support structure is attached to the fuselage afterbody canted bulkhead between FS 2011 and FS 2037, and between WL 328.9 and WL 387.5.

Engine mounting provisions are located on the bottom of the center engine support structure at FS 2053.8 and FS 2142.8.

The structural frames, and formers forward of FS 2068 are made of aluminum alloy. The frames and formers, aft of FS 2068, and the longerons, upper rib, and lower rib structures are made of titanium alloy.


NO. 2 LH LOWER ACCESS DOOR (471AL)
NO. 3 LH LOWER ACCESS DOOR (471BL)
NO. 4 LOUVERED ACCESS DOOR (471DL)
ZONE 471
FIREWALL ACCESS DOORS (471CL AND 471BR)
NO. 5 AFT MOUNT ACCESS DOOR (471EL)
NO. 1 RH FORWARD ACCESS DOOR (471AR) (RIGHT SIDE ONLY)
NO. 4 LOUVERED ACCESS DOOR (471CR)
NO. 5 AFT MOUNT ACCESS DOOR (471DR)
FS 2037.52
FS 2151
WL 387.50
WL 313.72
STRINGER (TYP)
FRAME (TYP)
WL 328.94
HH 5335
M1-A00-54-007

Center Engine Support Structure
Figure 1

R NO. 2 ENGINE SUPPORT STRUCTURE MOUNT BUSHINGS
R REMOVAL AND INSTALLATION

R 1. General

R This procedure covers the removal and installation of the No. 2 engine mount hole bushings when excessive wear or damage deems it necessary.

R 2. Equipment and Materials

R Cleaner - 1,1,1, Trichloroethane (MIL-T-81533), or equivalent

R Cleaner - Petroleum Base, for Primed Metals, Non-photo chemically Reactive, LCM32-1087, or equivalent

R Adhesive, Silicone, one part, RTV, Grey, LCM30-2085B TYPE 1, General Electric No. RTV 157, or equivalent

R Compound, Sealing, LCM40-2180, or equivalent

R Clean dry cloths

R 3. Referenced Procedures

R 6-40-00 Exterior Access Doors And Panels - Description and Operation

R 71-00-03 Fuselage-Mounted QEC Unit (Engine No. 2) - Removal and Installation

R 4. Removal/Installation

R A. Removal

R (1) Remove fuselage mounted QEC unit (Ref. 71-00-03).

R (2) Remove No. 1 RH forward access door 471AR and No. 5 aft mount access doors 471DR and 471EL (Ref. 6-40-00).

R (3) Remove screws, washers, engine mount cover and gaskets from forward engine mount (Ref. Fig. 401).

R (4) Remove nuts, washers, bolts and retainers from forward engine mount.

R (5) At forward and aft mounts, use a soft drift and lightly
R tap bearings out of mount holes.

R B. Installation

R (1) At forward and aft mounts, clean sealant from bushing
R holes and areas that contact bushing flanges (Ref. Fig.
R 401).

R NOTE: Use a clean cloth dampened with 1,1,1,
R Trichloroethane solvent. Wipe dry with clean
R dry cloths and allow to dry for a minimum of 10
R minutes prior to application of sealant.

R (2) Apply a coating of LCM40-2180 sealing compound to the
R inside diameter of the mount holes before inserting the
R bearings.

R (3) Apply a bead of LCM40-2180 sealing compound, 1/32 to
R 1/8 inch in width, to periphery of bushing.

R (4) Install bushings and make sure enough sealant was
R applied to form a continuous exuded bead of sealant
R from around the periphery of the bushings after
R installation.

R NOTE: The four bushings at the forward mount are not
R identical. The two bushings at the forward
R location have thicker flanges than aft location
R bearings. Verify correct bushings are installed
R at the proper locations.

R (5) Clean surface of forward engine mount cover and engine
R mount mating surface using a clean cloth dampened with
R petroleum base cleaner. Dry surfaces with clean
R cloths.

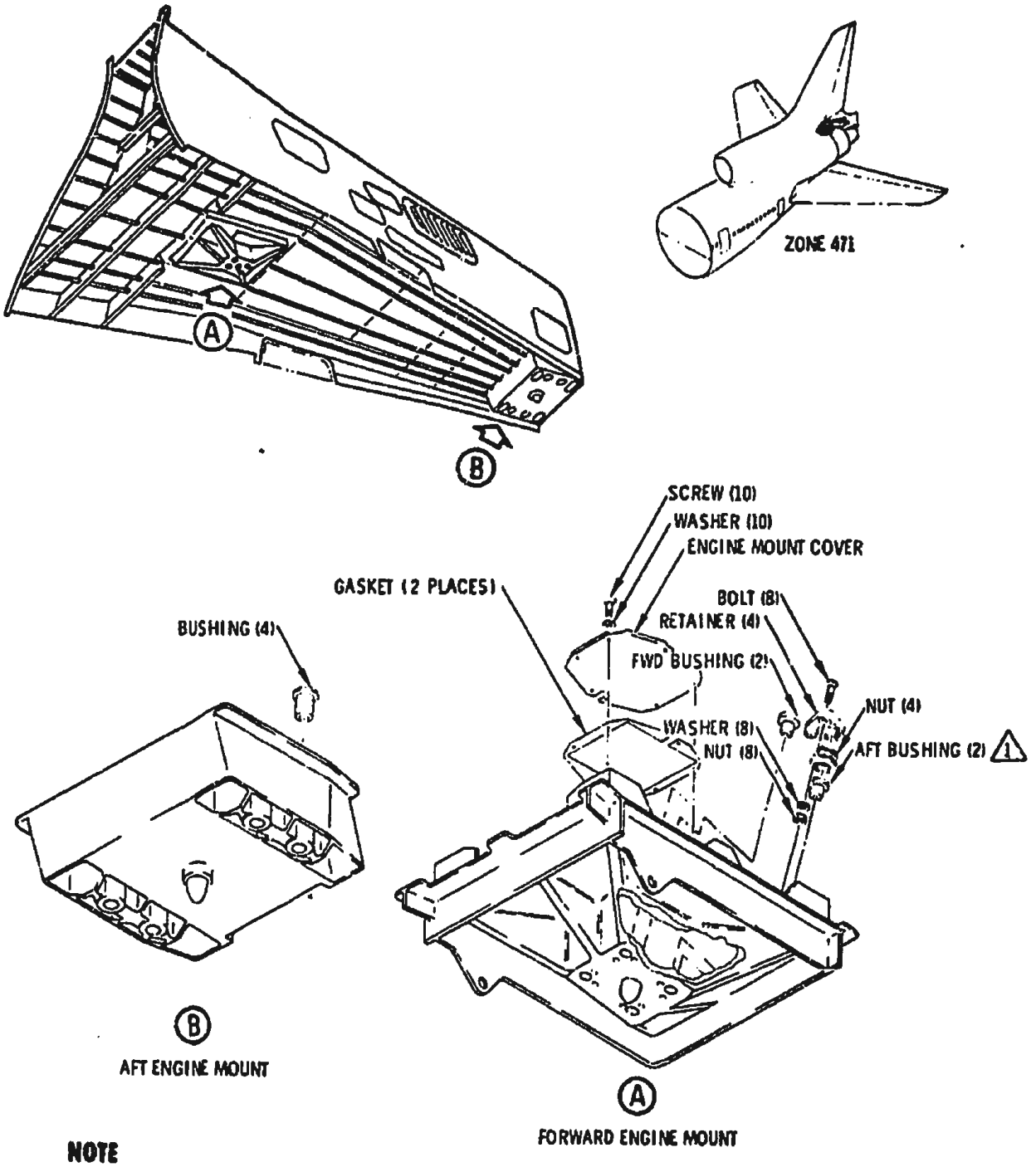
R NOTE: Do not allow cleaner to air dry.

R (6) Apply a coat of silicone adhesive, 0.005 to 0.015 inch
R in thickness, to each mating surface.

R (7) Install gaskets and engine mount cover on forward
R engine mount with washers and screws ensuring enough
R sealant was added to cause a bead of adhesive to be
R exuded along the cover edge after tightening.

R (8) Close access doors removed in Step 4A(2).

R (9) Install QEC unit removed in Step 4A(1).



NOTE

1. AFT BUSHINGS HAVE A THINNER FLANGE THAN FWD BUSHINGS AND ARE NOT INTERCHANGEABLE.

M1-0000-54-091

R Engine Mount Bushings - Removal and Installation
R Figure 401

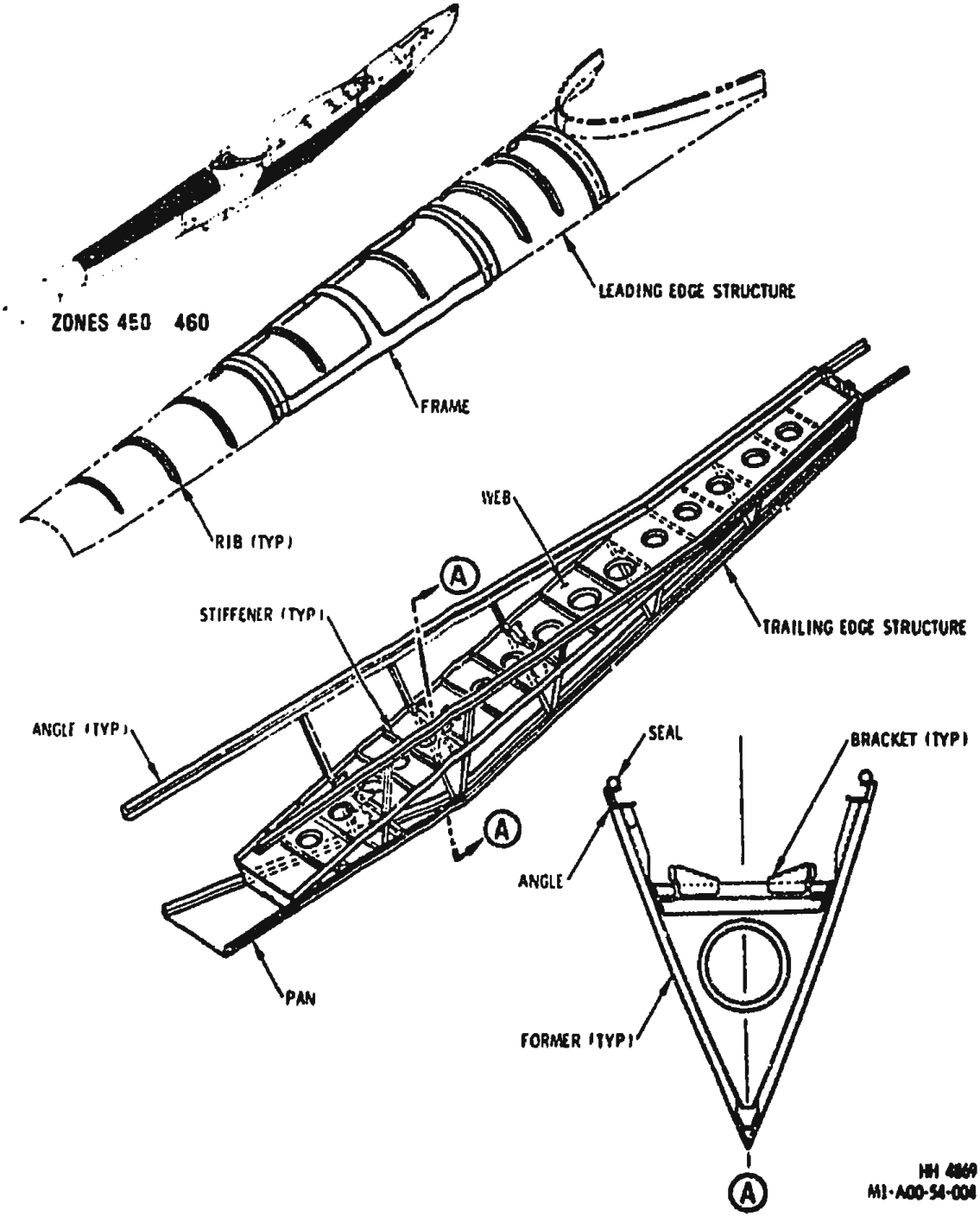
R EFFECTIVITY: ALL
R
001B

AUXILIARY STRUCTURE - DESCRIPTION AND OPERATION

1. General

The pylon auxiliary structure (Ref. Fig. 1) consists of the leading and trailing edges. The leading edge consists of three aluminum alloy covers stiffened with doublers. The removable covers attach to leading edge formers at PS 99.6, 145.40, 190.10, and 216.00, and to a plate flange fastened to the upper longerons.

The wedge shaped trailing edge consists of aluminum formers, a beam, and stringers. The trailing edge attaches to the aft edges of the main frame, and the rear end attaches to a fitting on the wing. A full-length bulb seal is attached to the upper edges of the trailing edge. The seal is made of Dacron covered silicone rubber. A fuel overboard drain line extends from the bottom of the structure.



Pylon Auxiliary Structure
Figure 1

NOSE COWL STRUCTURE (ENGINES NO. 1 AND 3) DESCRIPTION AND OPERATION

1. General

R The nose cowl structure (Ref. Fig. 1) consists of two basically
R circular diaphragms, one located at the front of the nose cowl
R and the other at the rear.

R The front diaphragm is made of titanium sheet and comprises four
R equal segments, joined together by four webs and strengthened by
R radial stiffeners. Six access panels, two in each segment,
R allow for inspection of the anti-icing air exhaust duct and
R support brackets. Angles of titanium sheet secured to the outer
R rim of the diaphragm and angles of clad aluminum alloy secured
R to the inner edge of the diaphragm, provide for the attachment
R of the inner and outer skins.

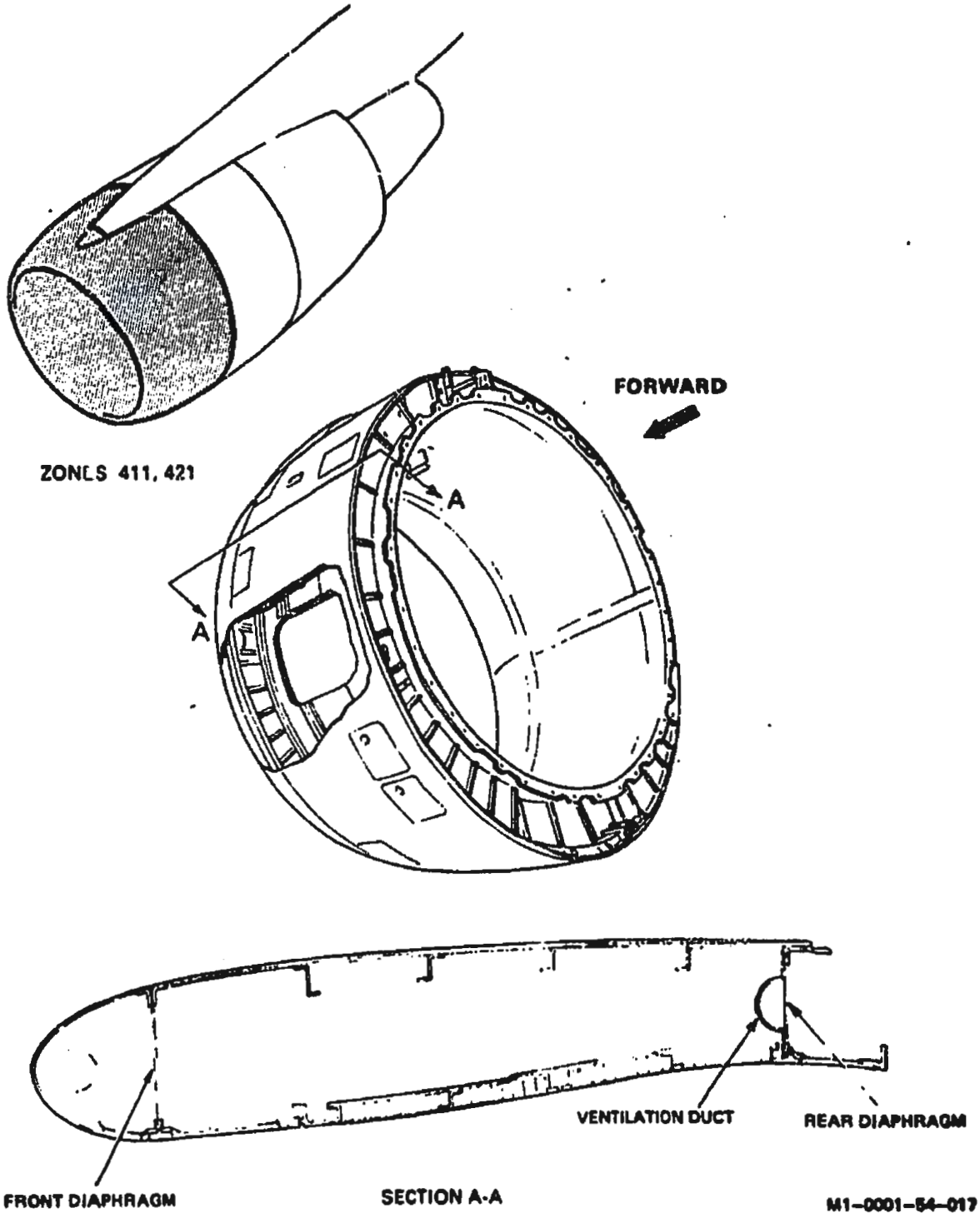
R The rear diaphragm is also made of titanium sheet and comprises
R an upper, left-hand, right-hand and lower segment secured
R together by webs and rivets, and strengthened by radial
R stiffeners.

R The lower segment is dished forward to provide clearance for
R engine mounted components.

R A ventilation duct, semi-circular in shape, is spot welded to
R the front face of the upper segment. Holes in the segment
R provide for the passage of ventilation air.

R Segmented angles attached to the inner edge and a segmented
R coaming angle attached to the outer edge of the diaphragm
R provide for the attachment of the nose cowl inner and outer
R skin.

R The rear coaming angle also provides the sealing land for the
R hinge side cowls.



R Nose Cowl Structure (Engines No. 1 and 3)
R Figure 1

EFFECTIVITY: ALL

HINGED COWLING SUPPORT STRUCTURE (ENGINES NO. 1 AND 3) - DESCRIPTION AND OPERATION

1. General

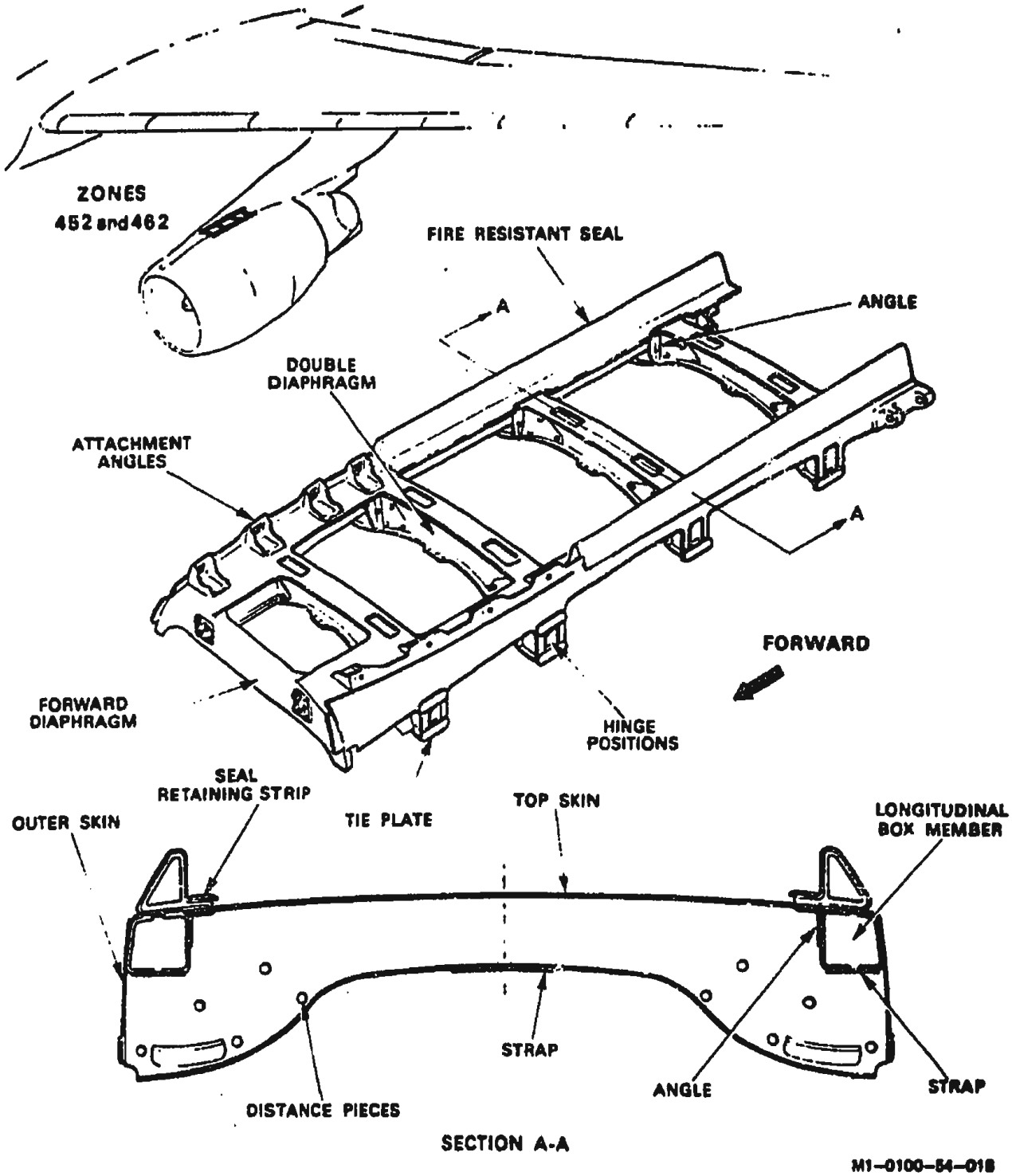
The support structure (Ref. Fig. 1) consists of two longitudinal box members connected by four double diaphragms, two at each of the four hinge positions and one single forward diaphragm at the forward end. The support structure is made of sheet titanium, secured together by spot welding, blind and solid rivets.

Each box member is formed by two channel sections joined at the bottom by a strap and at the top by a skin that extends over both box members; the top skin is cut away between the diaphragms to provide clearance for engine to aircraft systems.

The forward diaphragm is attached to both box members, the outer
R vertical skin and bottom strap by a cleat.

R The four double diaphragms are located at the side cowl hinge
R position at PPS (Power Plant Station) 78.75 in, PPS 91.75 in.,
R PPS 108.5 in., and PPS 120.0 in. Each pair of diaphragms are
R mounted back to back approximately 1.0 in. apart. The gap is
R maintained by clamping each pair of diaphragms around ten
R distance pieces, five at each side, secured with bolts and nuts.
R The diaphragms are secured to the top skin, the outer vertical
R skins and box members by angles plates and cleats, and tied
R together locally at the bottom by tie plates.

R A fire resistant seal is secured longitudinally to the top of each box member by cold bonding and a retaining plate and rivets.



Hinged Cowling Support Structure (Engines No. 1 and 3)
Figure 1

WING PYLON LEADING EDGE STRUCTURE - DESCRIPTION AND OPERATION

1. General

The wing pylon leading edge structure (Ref. 54-20-00, Fig. 1) consists of the skin reinforcing formers on the inner surface of three removable leading edge panels which serve as access covers. The aft cover is attached to the forward end of the diverter fairing at PS 216. The forward cover is attached to the nose fairings at PS 99.6. The leading edge ribs and frame are made of aluminum alloy.

WING PYLON TRAILING EDGE STRUCTURE - DESCRIPTION AND OPERATION

1. General

The wing pylon trailing edge structure (Ref. 54-20-00, Fig. 1) is constructed of formers, a stiffener-reinforced web beam, and extruded angles made of aluminum alloy. The structure is attached to the aft end of the main frame at approximately PS 255. The trailing edge assembly covers the pylon drag strut fitting and the hydraulic system plumbing lines.

WING PYLON TRAILING EDGE ASSEMBLY - REMOVAL AND INSTALLATION

1. General

This procedure provides instructions for removal and installation of the trailing edge assembly, located approximately between PS 250 and PS 397 (Ref. Fig. 401).

2. Referenced Procedures

54-51-54	Wing Pylon Glove Fairing - Removal and Installation
54-51-56	Trailing Edge Wedge Fairing - Removal and Installation

3. Removal/Installation

NOTE: The various attachment bolts at the trailing edge forward end are not of uniform size and length. Therefore, identify bolts to assure reinstallation at the proper location. When bolts have been reinstalled, verify that bolt threads protrude through the nut a proper amount.

A. Removal

(1) Remove wing pylon glove fairing assembly (Ref. 54-51-54).

(2) Remove trailing edge wedge fairing assembly (Ref. 54-51-56).

NOTE: Provide proper support for the trailing edge assembly before removal of fasteners at forward and aft ends of the assembly.

(3) Remove attachment bolts on each side at forward support bulkhead (Ref. Fig. 401).

(4) Remove large access door, 463DL or 453DR, located at forward end of trailing edge assembly and on inboard side only of each pylon.

(5) Remove two bolts, located at each side of trailing edge assembly, which attach clip to angle.

(6) Remove two bolts, located at PS 282, and at each side of trailing edge assembly, which attach strut to side angles (Ref. Fig. 401).

(7) Remove two bolts, located at PS 397, which attach trailing edge assembly support to wing mounted support fittings (Ref. Fig. 401).

(8) Remove trailing edge assembly by pulling aft and down.

NOTE: The trailing edge assembly must move aft enough for the slotted forward ends of the side panels to disengage from the aft end of the pylon box assembly. It should be unnecessary to loosen or remove the five screws, spacers, and support at the aft end of the pylon box assembly side panels (Ref. Fig. 401).

(9) Lower trailing edge assembly and stow as required to prevent damage.

B. Installation

NOTE: The trailing edge assembly attachment holes have washers which are bonded to the fiber glass shell. Before beginning the installation of trailing edge assembly, verify that washers are present, and again as individual bolts are installed. The same is true for the seal attachment screws.

(1) Check condition seals and replace, if required. If replacement is necessary, proceed as follows:

(a) Remove seal, seal retainer and strip by removing all attachment screws (Ref. Fig. 401).

(b) Clean seal area and retainer as required.

(c) Cut replacement seal to same length of replaced seal.

(d) Determine hole pattern and cut holes in replacement seal.

(e) Place seal, seal retainer and strip in same position as removed, and loosely install attachment screws (Ref. Fig. 401).

NOTE: The seal on each side extends the entire length of the trailing edge assembly. The seal filler (teflon tubing) and backup strip extend from forward end to

approximately three fourths of the seal length.

(f) Adjust seal as required and tighten screws.

NOTE: With trailing edge assembly installed, the seal must be in contact with lower surface of skirt fairing its entire length.

(2) Check condition and dimensions of pads located on each of three bulkheads, beginning at PS 282 and proceeding aft. Make adjustments as required to provide a total clearance of 0.010 inch with drag strut (Ref. Fig. 401).

NOTE: These 6 pads (2 on each bulkhead) are made of phenolic cotton fiber and have aluminum laminated shims for adjustment. The pad and shim is attached with two screws, washers and nuts.

(3) Position trailing edge assembly in approximate position, with aft end lower than forward end.

(4) Align and engage slots at forward end of side panels with the respective screws and spacers at aft end of pylon box assembly.

NOTE: When slots are properly aligned, move trailing edge assembly forward until attachment holes in skin panels align with holes in support structure.

(5) At aft end of trailing edge assembly, PS 397, reinstall two support hinge bolts.

NOTE: These bolts are shoulder type and the bolt heads are on the inboard side of the hinges.

(6) Reinstall strut at PS 282, by installing one bolt at each side.

(7) Reinstall two bolts, located at each side of trailing edge assembly, which attach clip to angle.

(8) Reinstall attachment bolts on each side at forward support bulkhead (Ref. Fig. 401).

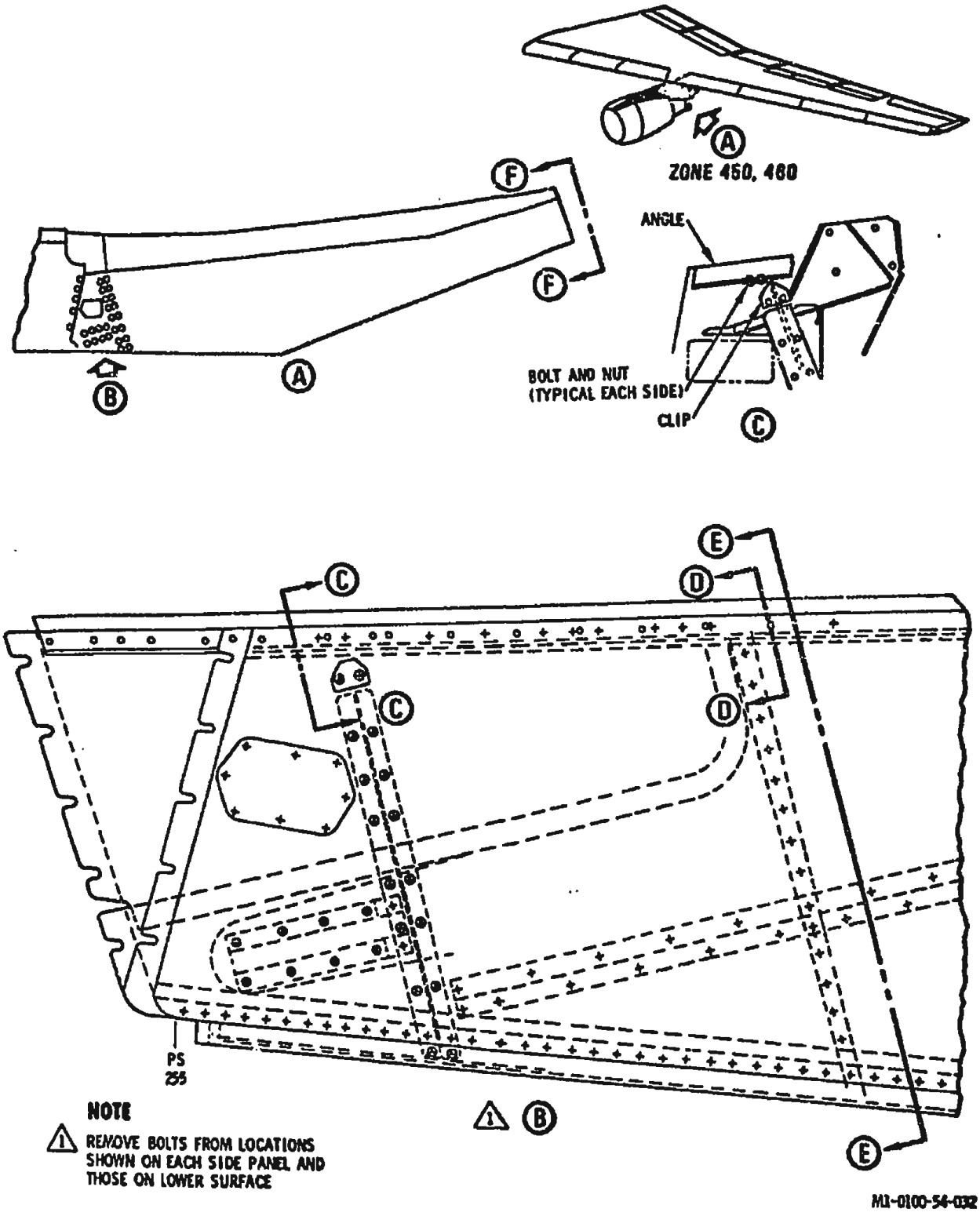
(9) Check that all attachment bolt threads protrude through nut plates a proper amount.

(10) Reinstall access door 463DL or 453DR.

(11) Verify that trailing edge assembly seal is in contact with lower surface of skirt fairing on both sides, its entire length.

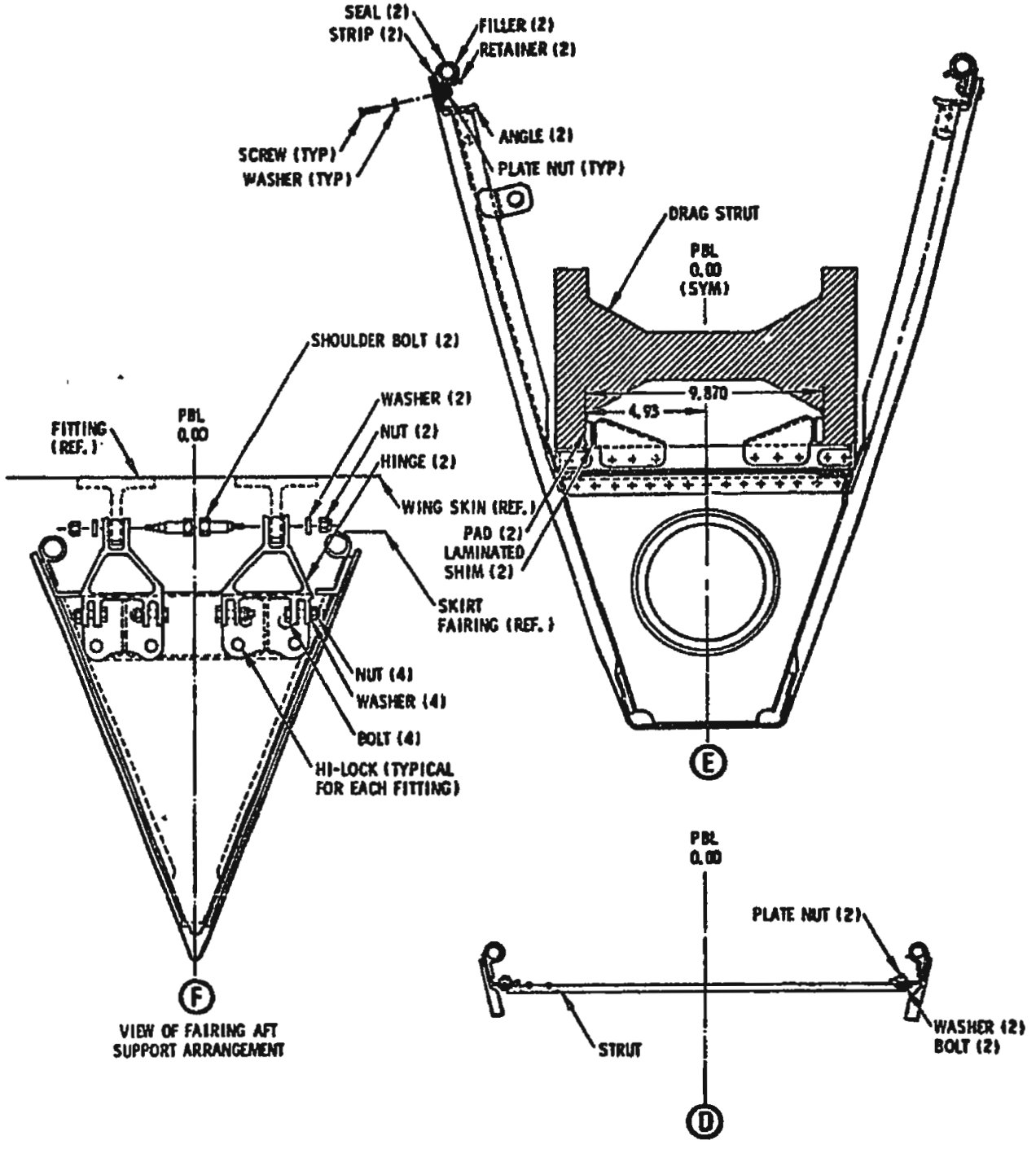
(12) Reinstall trailing edge wedge fairing assembly (Ref. 54-51-56).

(13) Reinstall wing pylon glove fairing assembly (Ref. 54-51-54).



R R Pylon Trailing Edge Assembly - Removal and Installation
Figure 401 (Sheet 1)

R R 001B EFFECTIVITY: ALL



M1-0100-54-039

R Pylon Trailing Edge Assembly - Removal and Installation
R Figure 401 (Sheet 2)

R EFFECTIVITY: ALL
R
001B

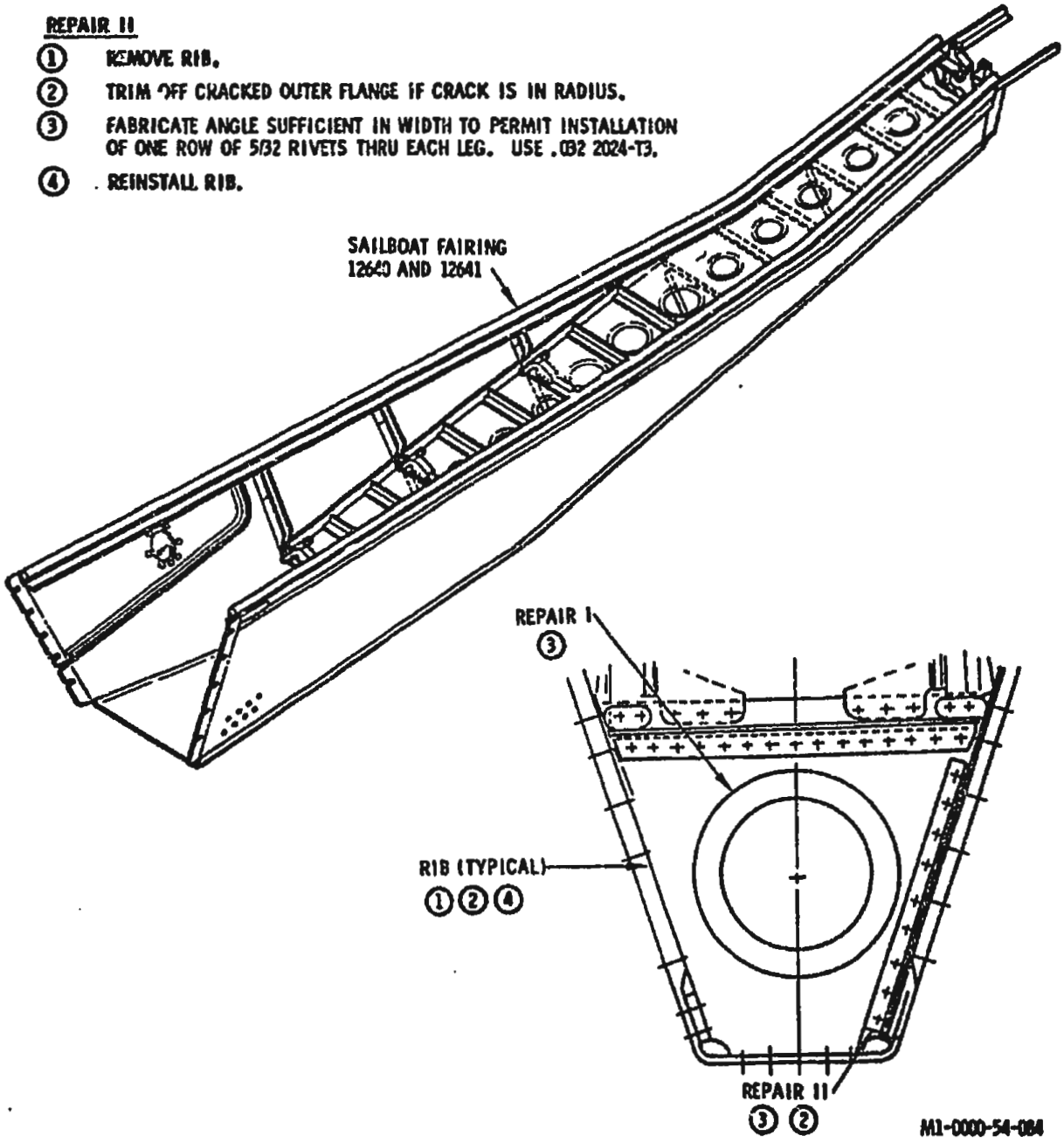
CR

WING PYLON TRAILING EDGE ASSEMBLY - APPROVED REPAIRS

WING PYLON TRAILING EDGE ASSEMBLY - APPROVED REPAIRS

1. REPAIR I
   - ① REMOVE RIB.
   - ② FABRICATE NEW RIB FROM .032 2024-T3.
   - ③ IN LIEU OF FLANGING THE LIGHTENING HOLE FABRICATE AND INSTALL A DOUBLER AROUND HOLE. USE .032 2024-T3 WITH 2 ROWS OF 5/32 RIVETS. INSTALL RIB.

2. REPAIR II
   - ① REMOVE RIB.
   - ② TRIM OFF CRACKED OUTER FLANGE IF CRACK IS IN RADIUS.
   - ③ FABRICATE ANGLE SUFFICIENT IN WIDTH TO PERMIT INSTALLATION OF ONE ROW OF 5/32 RIVETS THRU EACH LEG. USE .032 2024-T3.
   - ④ REINSTALL RIB.



CR CR Wing Pylon Trailing Edge Assembly - Approved Repairs
Figure 801

R EFFECTIVITY: ALL
R
001B

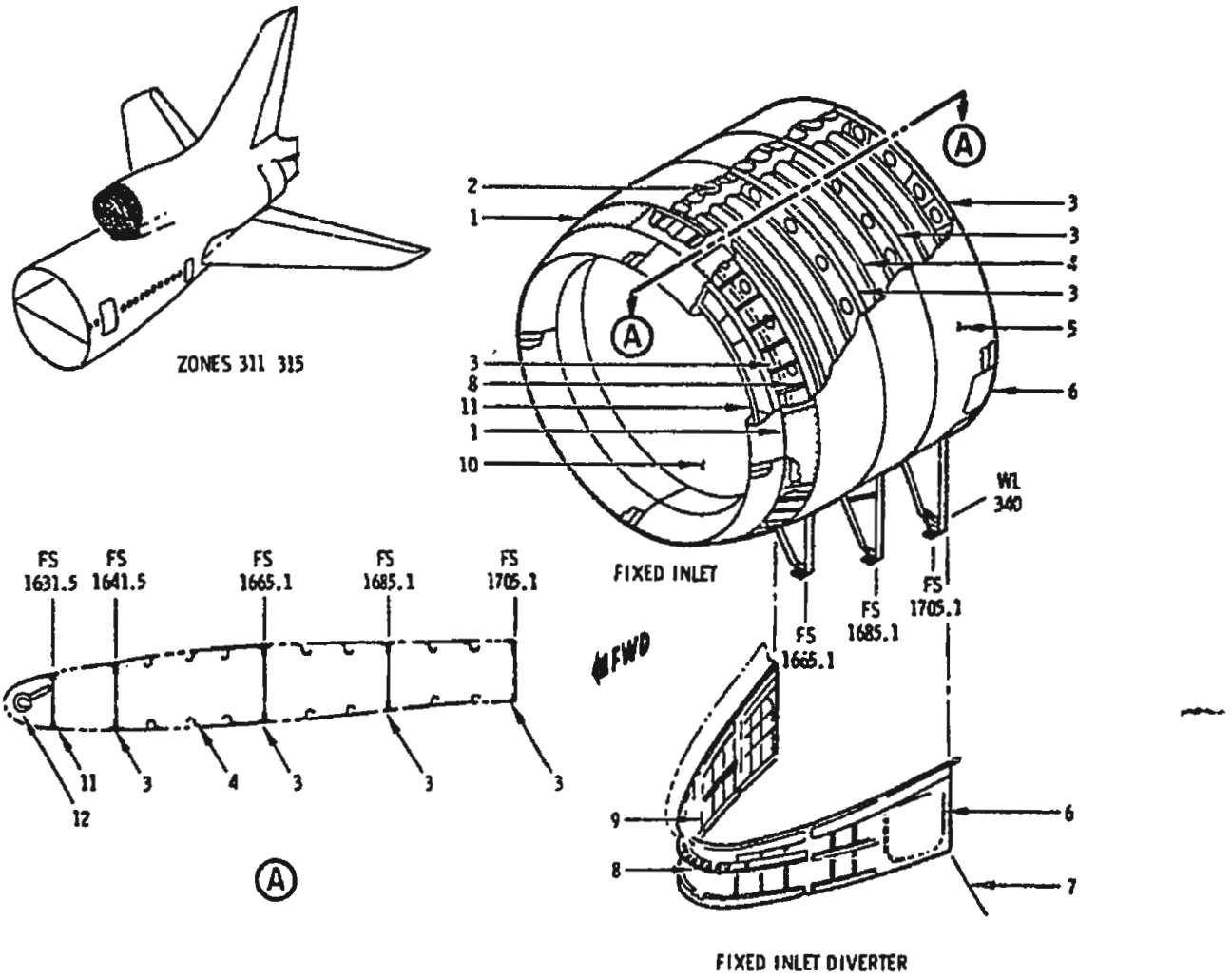
CENTER ENGINE FIXED INLET STRUCTURE - DESCRIPTION AND OPERATION

1. General

The center engine fixed inlet (Ref. Fig. 1) is designed to direct air to the NO. 2 engine, and is located between FS 1623 and FS 1705. The upper surface of the fixed inlet is approximately at WL 458.

The fixed inlet structure consists of five frame assemblies, Z-ring stiffeners, stringers, and fittings. All structural members, except one frame, are made of aluminum alloy. The frame at FS 1631.5 is made of titanium alloy.

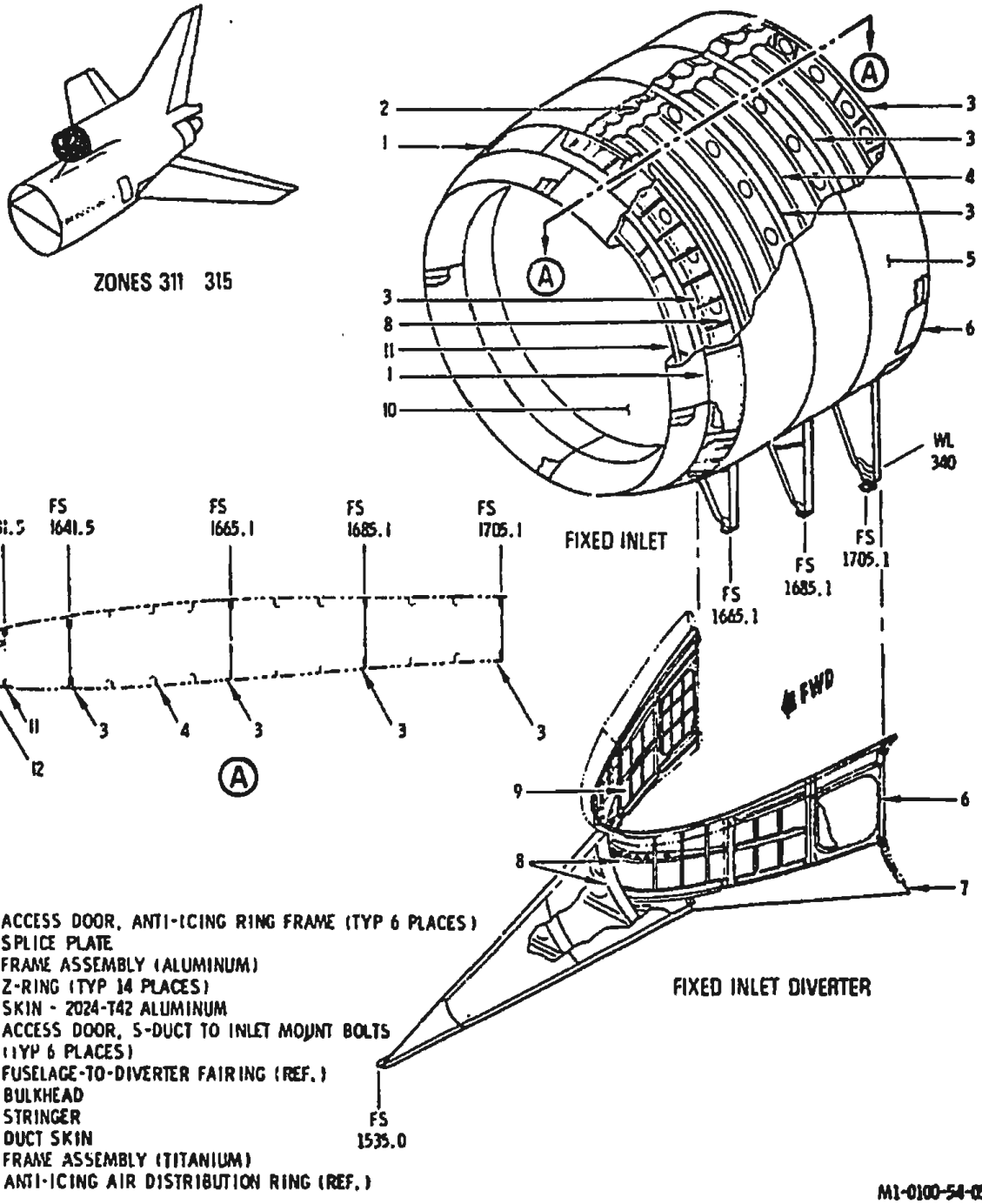
A removable nose cowl is located on the forward end of the fixed inlet structure. The fixed inlet structure may be removed to facilitate removal of the S-duct assembly from the fuselage afterbody.



1 ACCESS DOOR, ANTI-ICING RING FRAME (TYP 6 PLACES)
2 SPLICE PLATE
3 FRAME ASSEMBLY (ALUMINUM)
4 Z-RING (TYP 14 PLACES)
5 SKIN - 2024-T42 ALUMINUM
6 ACCESS DOOR, S-DUCT TO INLET MOUNT BOLTS (TYP 6 PLACES)
7 FUSELAGE-TO-DIVERTER FAIRING (REF)
8 RIB
9 STRINGER
10 DUCT SKIN
11 FRAME ASSEMBLY (TITANIUM)
12 ANTI-ICING AIR DISTRIBUTION RING (REF)

M1-0101-54-009

Center Engine Fixed Inlet Structure
Figure 1



1 ACCESS DOOR, ANTI-ICING RING FRAME (TYP 6 PLACES)
2 SPLICE PLATE
3 FRAME ASSEMBLY (ALUMINUM)
4 Z-RING (TYP 14 PLACES)
5 SKIN - 2024-T42 ALUMINUM
6 ACCESS DOOR, S-DUCT TO INLET MOUNT BOLTS (TYP 6 PLACES)
7 FUSELAGE-TO-DIVERTER FAIRING (REF.)
8 BULKHEAD
9 STRINGER
10 DUCT SKIN
11 FRAME ASSEMBLY (TITANIUM)
12 ANTI-ICING AIR DISTRIBUTION RING (REF.)

M1-0100-54-056

Center Engine Fixed Inlet Structure
Figure 1

CENTER ENGINE S-DUCT - DESCRIPTION AND OPERATION

1. General

R The center engine S-duct directs the flow of air to the center
R (No. 2) engine. The S-duct is located inside the afterbody and
R extends from the aft end of the fixed air inlet, FS1705, to the
R fireseal located at the canted bulkhead, FS2000 approximately
R (Ref. Fig. 1). The S-duct consists of three segments,
R identified as forward, center and aft. These segments are
R bolted together and can be separated for removal and
R installation. In addition, an air intake adapter is provided to
R connect the S-duct assembly to the engine. This section is
R bolted to the aft end of the aft segment, and to the engine fan
R case forward flange.

R The forward segment is bolted to the aft end of the fixed air
R inlet structure and to the forward end of the center segment.

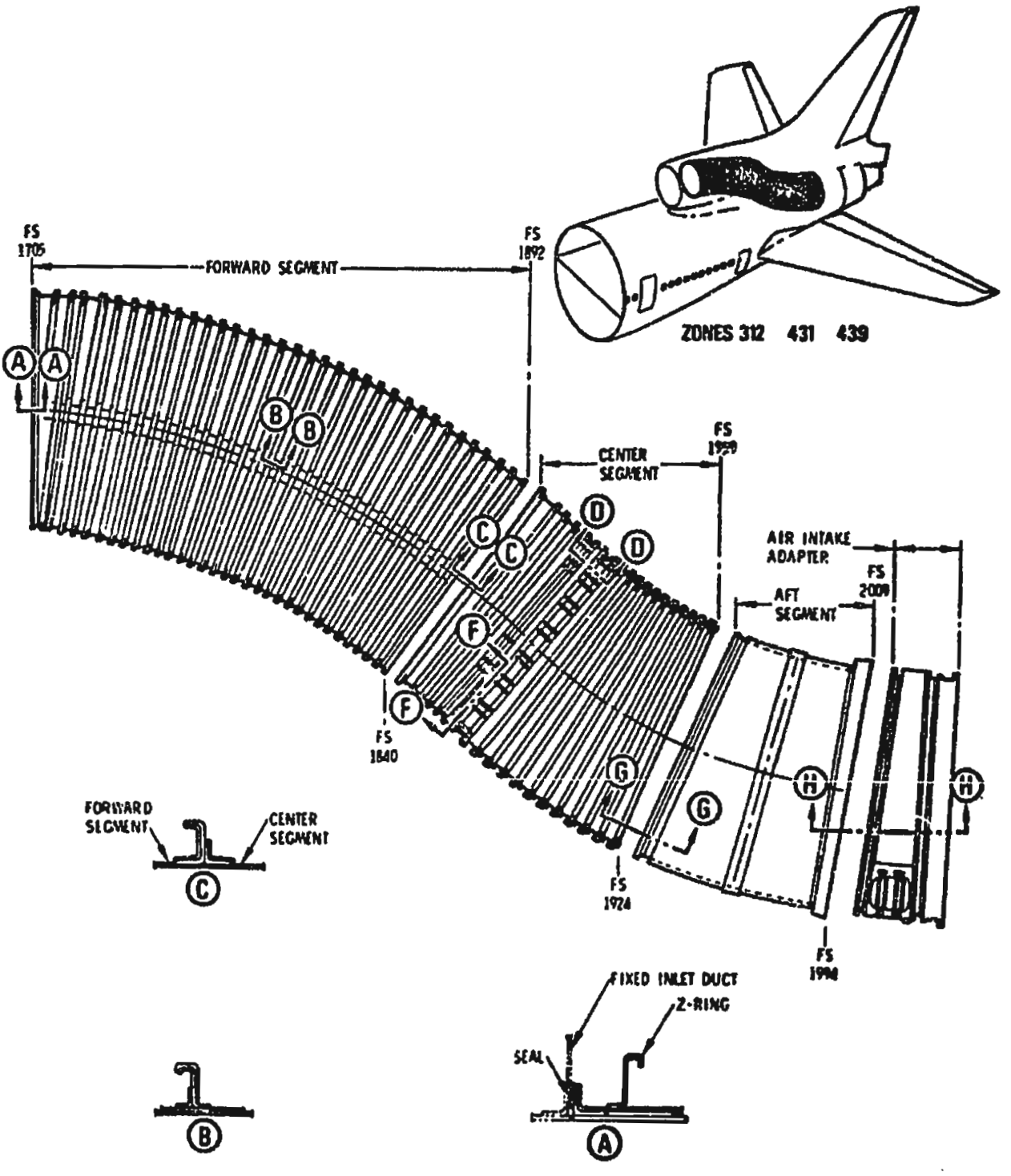
R The center segment consists of two sections which are joined to
R form a slip joint assembly. The slip joint assembly provides
R for forward and aft movement of the S-duct segments located aft
R of the joint, while preventing rotational movement. The slip
R joint is sealed by a seal assembly consisting of a tubular seal
R and bearing strips, both held in position by bearing retainer
R sections. The aft end of the segment bolts to the forward end
R of the aft segment.

R The aft segment aft channel ring joins with the forward end of
R the air intake adapter. The channel ring also has provisions
R for attachment of the flexible fireseal to the S-duct. The
R outside diameter of the fireseal attaches to the canted bulkhead
R ring. This segment has an accoustical honeycomb material
R installed along the outside surface of the S-duct skin, and is
R enclosed by channels and outside skin. The inner skin is
R perforated in the honeycomb area.

R The air intake adapter consists of two sections forming a slip
R joint assembly similar to the center segment slip joint. This
R segment bolts to the engine fan case forward flange and to the
R aft channel ring of the aft segment. The forward section of
R this assembly also has an area of accoustical honeycomb material
R similar to the aft segment. A hinged door is provided to permit
R personnel to enter the S-duct for inspection of engine fan area
R and S-duct.

R All S-duct segments have channels and Z-rings made of 2024
R aluminum alloy, and are fastened to the outside circumferance of
R the S-duct skin (2024 aluminum alloy) with flush fasteners.

R The S-duct is supported by three adjustable support rods.
R Built-in fittings are provided in the forward section of the
R center segment, while fittings on surrounding aircraft structure
R are attached with bolts.



M1-0101-54-006

R Center Engine S-duct - Description and Operation
R Figure 1

R EFFECTIVITY: ALL
R
001B

CENTER ENGINE S-DUCT - REMOVAL AND INSTALLATION

1. General

This procedure applies to the S-Duct aft segment and center segment (slip joint assembly). These segments are located between the No. 2 engine air intake adapter and the aft end of the forward segment (Ref. Fig. 401). The aft segment is a single piece unit. The center segment consists of a forward and aft section which are joined to form a slip-joint assembly. The center segment is removed and installed as an assembly; with disassembly and reassembly performed on the floor.

2. Equipment and Materials

Block and Tackle or equivalent

Ropes, as required, or equivalent

2 X 4 timbers as required, or equivalent

Shoring, padding, or other protective materials as required

Workstand

Lock-wire QQ-W-390 (Temp. A, Annealed) inconel wire, 0.020 inch diameter

R Sealant LCM40-2121 or equivalent

3. Referenced Procedures

20-51-04	Environmental sealing of Model L-1011 Airplane
29-11-00	Hydraulic Power System - Maintenance Practices
70-12-02	Fitting Vee Band Coupling Clamps
71-00-03	Fuselage-Mounted QEC Unit (Engine No. 2) - Removal and Installation

4. Removal/Installation

A. Removal

WARNING: ENSURE THAT ALL FOUR HYDRAULIC SYSTEMS ARE SHUT OFF (REF. 29-11-00). TAG FLIGHT ENGINEER/SECOND OFFICERS HYDRAULIC SYSTEM PANEL, ZONE 215, AND THE HYDRAULIC SERVICE PANEL, ZONE 147.

(1) Remove No. 2 engine and air intake adapter (Ref. 71-00-03).

(2) Open access doors 313 FR, 318 GL and 318GR to gain access to area forward of firewall.

(3) Attach block and tackle (or equivalent) to heavy structure in upper tail section above S-Duct aft segment.

(4) Wrap ropes around aft segment and attach to block and tackle. Take up slack to support aft segment.

(5) Remove firewall seal assembly which is attached to aft segment aft channel and to canted bulkhead ring (Ref. Fig. 401).

NOTE: Identify inner and outer flame shields locations to facilitate reinstallation. Retain all miscellaneous hardware for reinstallation.

(6) Remove drain valve from boss (located at lower aft end of aft segment).

(7) Position 2 X 4 timbers or equivalent under aft segment, to support and serve as runners for sliding segment through canted bulkhead and out of aircraft. Shore as required to support segment while removing flange attachment bolts.

(8) Provide shoring support as required at aft end of center segment (joint assembly).

(9) Remove bolts from flange joint at forward end of aft segment.

NOTE: Access to approximately two thirds of flange bolts is possible by standing on horizontal
R stabilizer box section. The remainder of bolts
R are accessible through access door 313 FR. The horizontal stabilizer box section surface should be protected with padding, plywood or equivalent.

(10) Remove aft segment by sliding aft on 2 X 4 timbers (or equivalent) through canted bulkhead and out onto workstand.

R (11) Move aft segment to appropriate stowage or work area.

R (12) Remove ropes from aft segment.

R NOTE: If only the aft segment is to be removed, this
R completes the removal procedure. If the center
R segment (slip-joint assembly) is to be removed,
R continue with Step 13 and subsequent steps.

R (13) In area above center segment, remove two lines which
R connect to P1 sensor probe (Ref. Fig. 402) as follows:

R (a) Remove short line which connects P1 sensor probe
R to No. 2 engine anti-icing duct.

R (b) Remove P1 pressure line which runs to No. 2
R engine. Disconnect at P1 sensor probe and at
R fitting on forward side of canted bulkhead, FS
R 2011.

R (14) In area above S-Duct center segment (slip-joint
R assembly), remove section of No. 2 engine anti-icing
R duct, extending from coupling joints at FS 1886 and FS
R 1942 (Ref. Fig. 402).

R NOTE: From joint at aft right side, FS 1942, this duct
R runs forward and crosses over S-Duct to left,
R then forward to joint at FS 1886.

R (15) Relocate block and tackle to area of tail section above
R center segment.

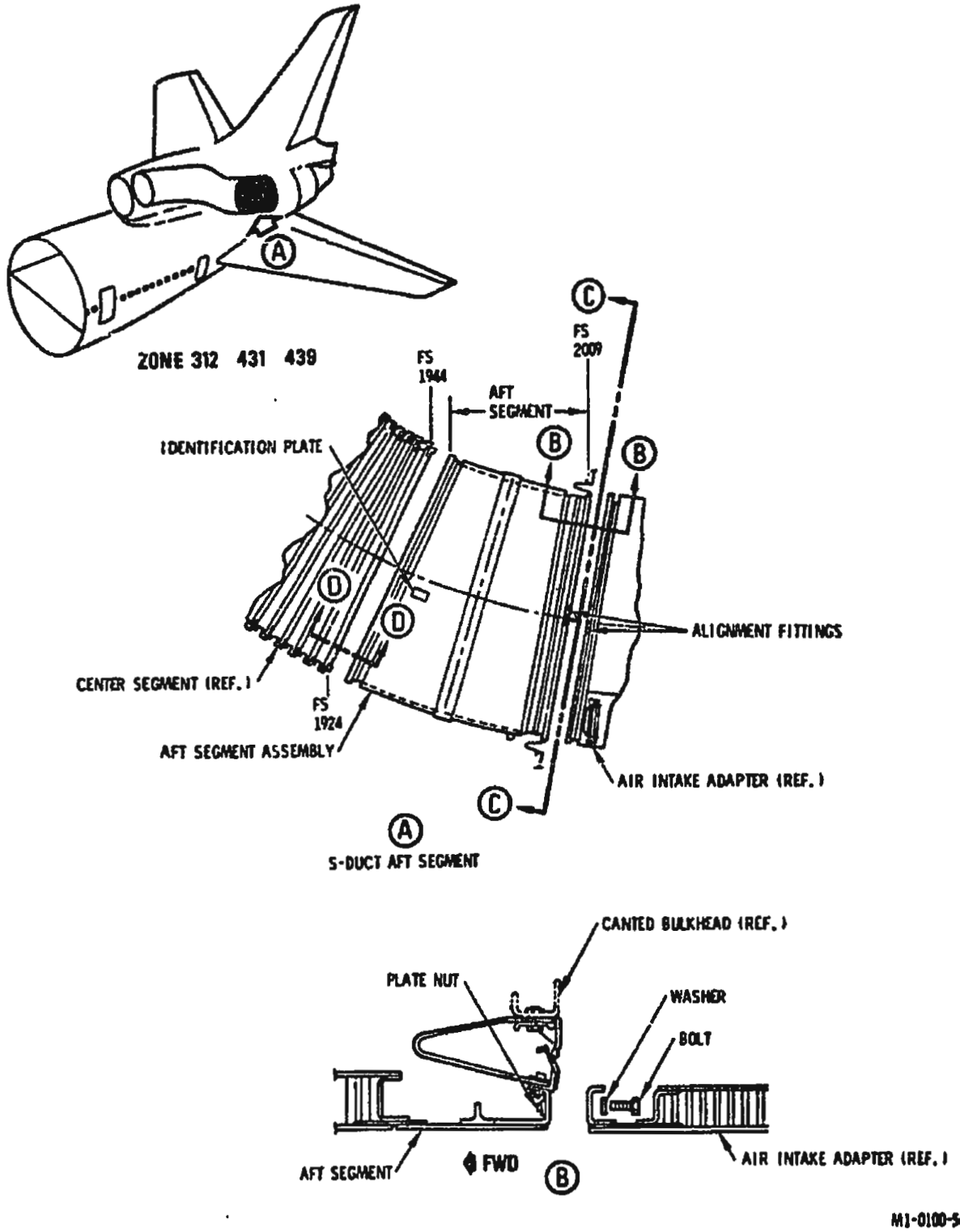
R (16) Wrap ropes, or equivalent, around center segment and
R attach to block and tackle.

R NOTE: The center segment (slip-joint assembly),
R consisting of a forward and aft section, is
R removed and installed as an assembly.
R Disassembly and reassembly is performed on the
R floor.

R (17) Shore aft end of forward section to provide support
R when flange bolts are removed.

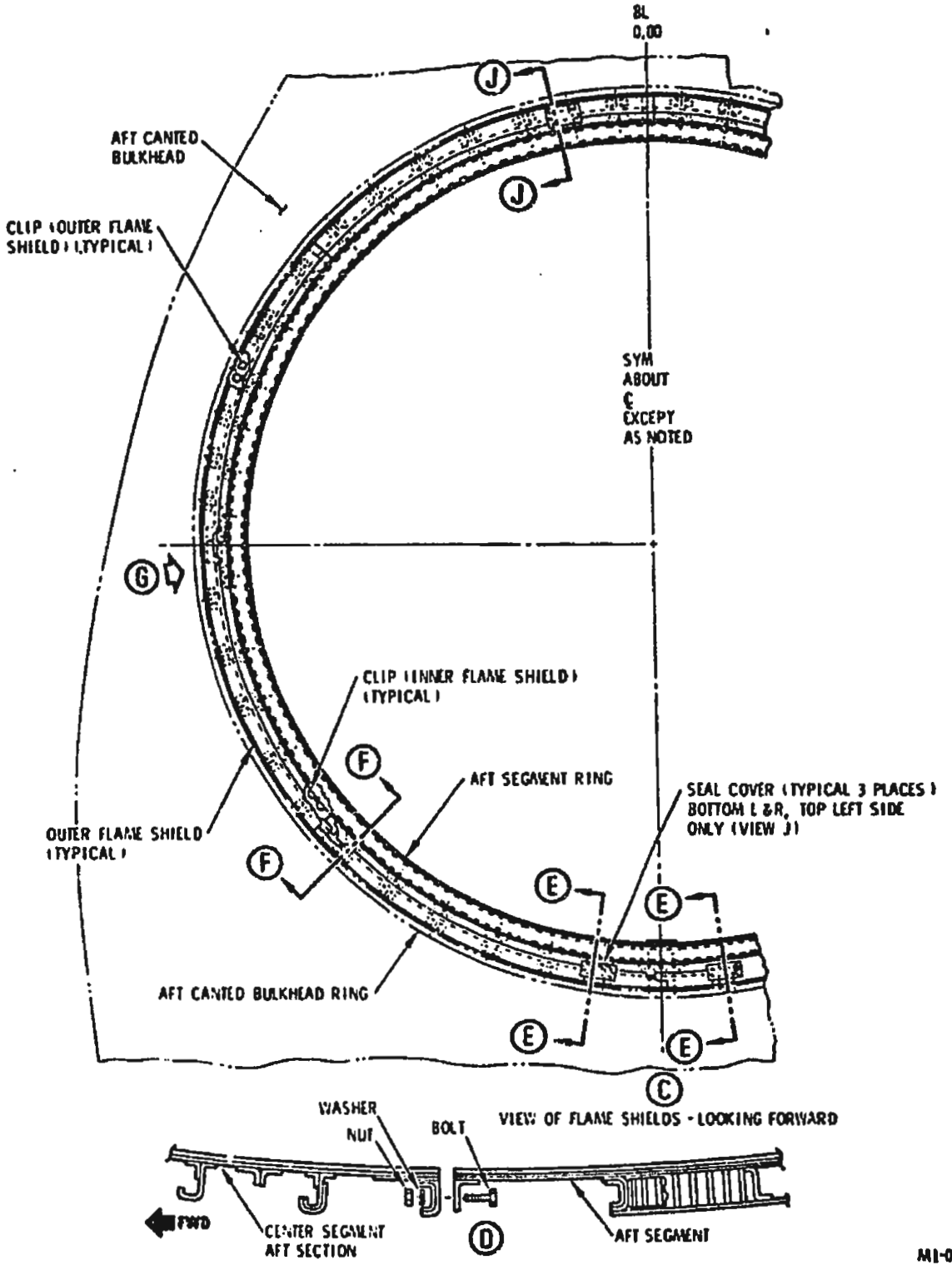
R (18) Position 2 X 4 timbers (or equivalent) under center
R segment to support and serve as runners to slide
R segment aft.

R (19) Remove bolts from two vertical support rods (left and
R right) at S-duct forward section fittings (Ref. Fig.
R 403).



R Center Engine S-Duct - Removal and Installation
R Figure 401 (Sheet 1)

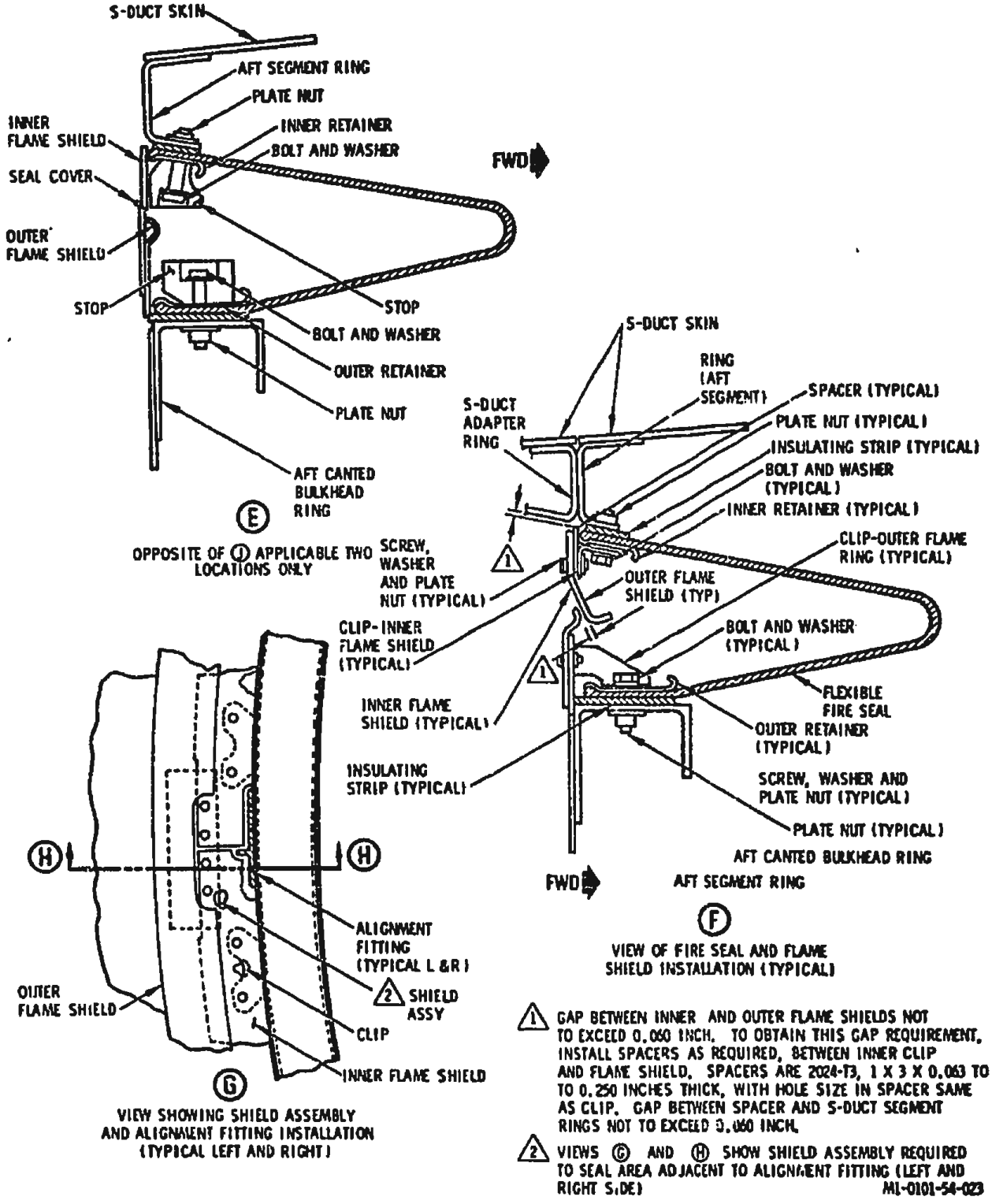
R EFFECTIVITY: ALL
R
R
001E



M1-0100-54-022

R Center Engine S-Duct - Removal and Installation
R Figure 401 (Sheet 2)

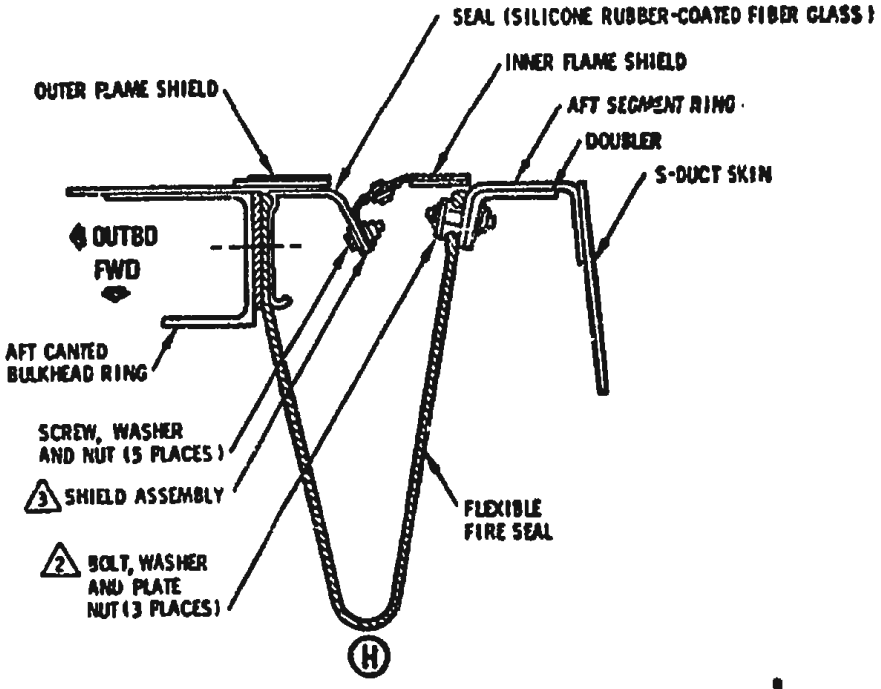
R EFFECTIVITY: ALL
R
001B



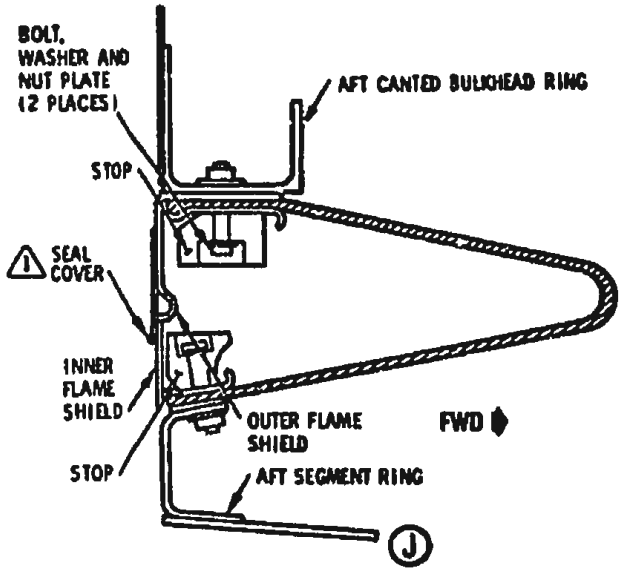
1. GAP BETWEEN INNER AND OUTER FLAME SHIELDS NOT TO EXCEED 0.060 INCH. TO OBTAIN THIS GAP REQUIREMENT, INSTALL SPACERS AS REQUIRED, BETWEEN INNER CLIP AND FLAME SHIELD. SPACERS ARE 2024-T3, 1 X 3 X 0.063 TO TO 0.250 INCHES THICK, WITH HOLE SIZE IN SPACER SAME AS CLIP. GAP BETWEEN SPACER AND S-DUCT SEGMENT RINGS NOT TO EXCEED 0.060 INCH.
2. VIEWS (G) AND (H) SHOW SHIELD ASSEMBLY REQUIRED TO SEAL AREA ADJACENT TO ALIGNMENT FITTING (LEFT AND RIGHT SIDE)

M1-0101-54-023

R
R Center Engine S-Duct - Removal and Installation
Figure 401 (Sheet 3)



VIEW SHOWING SHIELD ASSEMBLY INSTALLATION AND ALIGNMENT FITTING ATTACH BOLTS



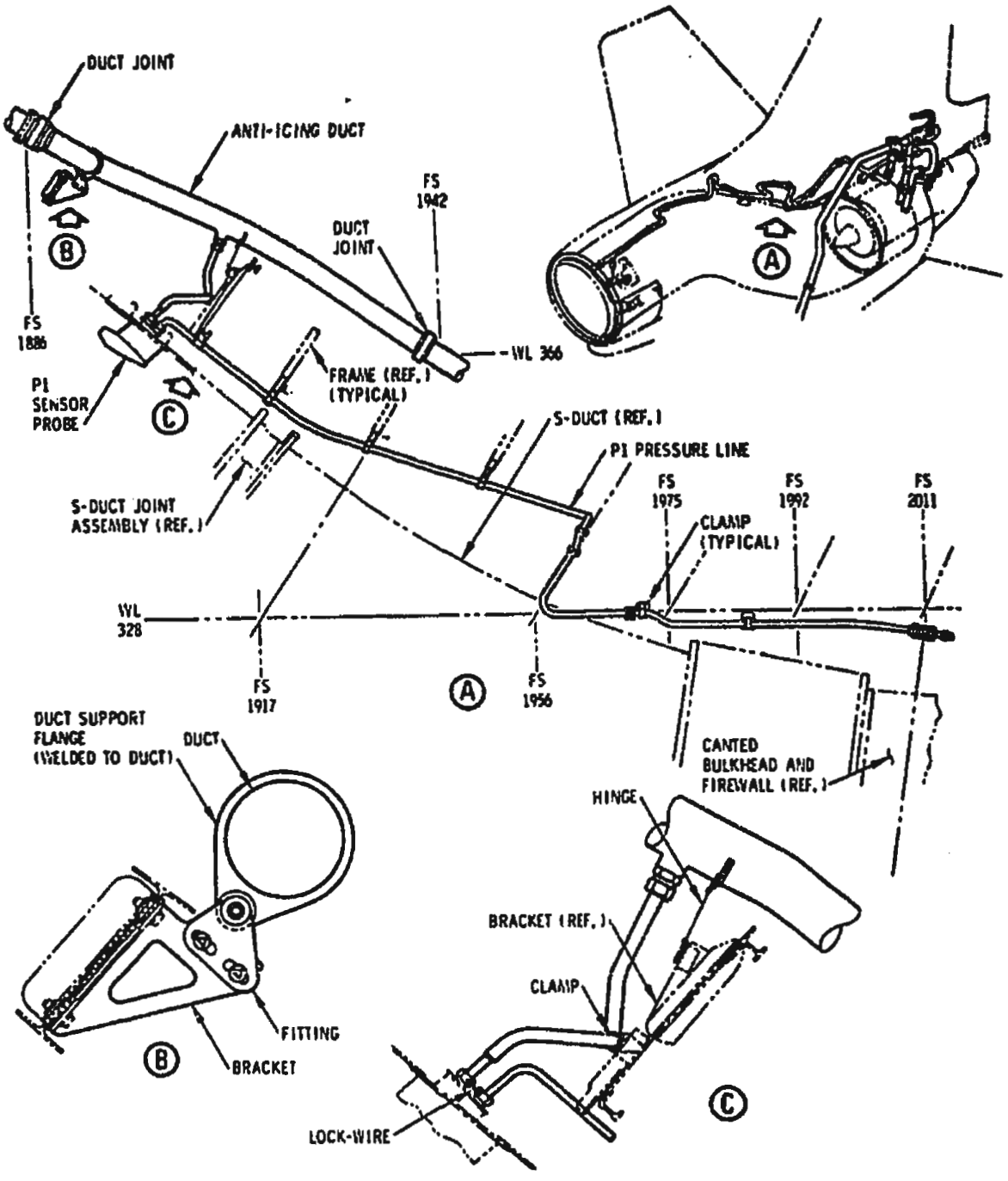
THIS VIEW OPPOSITE (E) APPLICABLE ONE LOCATION ONLY

NOTE

1. VIEWS (E) AND (J) HAVE CUTOUT OPENINGS IN FLAME SHIELDS WHICH REQUIRE SMALL SEAL COVER PLATES IN LOCALIZED AREAS
2. THESE BOLTS ATTACH ALIGNMENT FITTING (LEFT AND RIGHT) TO AFT SEGMENT RING
3. VIEWS (G) AND (H) SHOW SHIELD ASSEMBLY REQUIRED TO SEAL AREA ADJACENT TO ALIGNMENT FITTING (LEFT AND RIGHT SIDE)

M1-0100-54-029

Center Engine S-Duct - Removal and Installation
Figure 401 (Sheet 4)



M1-0100-54-024

No. 2 Engine Anti-icing Duct and P1 Pressure Line
Removal and Installation
Figure 402

R
R
001B EFFECTIVITY: ALL

NOTE: The vertical and horizontal support rods are adjusted to a no-load setting. However, if bolts cannot be removed with normal force, shorten or lengthen rods to relieve pressure on bolts.

Fold and secure the two vertical support rods to side structure.

(20) Remove horizontal support rod (left side only) by removing attachment bolts at structure fitting, and fitting on S-duct forward section.

(21) Remove flange bolts at forward end of center segment.

(22) Using block and tackle to support center segment, move aft along 2 X 4 timbers (or equivalent) until out of aircraft. Relocate block and tackle to aft locations as required.

NOTE: If interference is encountered between the center segment forward ring and the canted bulkhead ring at FS 1860, the forward ring width may be temporarily reduced by deflecting the sides toward the S-duct vertical centerline a total maximum of 1.25 inches. It is recommended that a turnbuckle and cable device be used, attaching to two end plates bolted to forward flange at minimum of two places each. Plates to be located parallel to and approximately 8-inches above horizontal centerline of S-duct. Remove device when appropriate.

(23) Move center segment to appropriate stowage or work area, with assembly resting on aft ring on protective material.

(24) If it is required that the forward and aft sections are to be disassembled, proceed as follows:

(a) For slip joint assemblies having cartridge type aligning units and two pairs of spring assemblies, remove nut from shaft end of all aligning units (12 places), and two bolts in each pair (2 places) of spring plates (Ref. Fig. 403).

For slip joint assemblies having spring plate assemblies (14 places), remove two bolts in each pair of spring plates (Ref. Fig. 403).

(b) Remove seal retainers (16 places). Identify retainers for installation at same location.

(c) Remove seal and seal plug.

(d) Remove bearing strips (6).

(e) Lift or separate forward section from aft section. Mark relative positions of each section to facilitate alignment at time of reassembly.

B. Installation

WARNING: ENSURE THAT ALL FOUR HYDRAULIC SYSTEMS ARE SHUT OFF (REF. 29-11-00). TAG FLIGHT ENGINEER/SECOND OFFICERS HYDRAULIC SYSTEM PANEL, ZONE 215, AND THE HYDRAULIC SERVICE PANEL, ZONE 147.

NOTE: If center segment forward and aft sections are disassembled, accomplish Step (1), if not, proceed to Step (2). To facilitate reassembly of the center segment (slip-joint assembly), place aft section on protected surface on floor with slip joint end facing upward. With sections aligned, lower forward section to engage with aft section. Place spacer blocks, or equivalent as required, around ring to separate sections to obtain working space.

(1) Reassemble forward and aft sections of center segment as follows:

(a) For slip-joint assemblies having cartridge type aligning units (12 places) and two pairs of spring plates, insert all aligning unit shafts (12 places) into aligning bearing housings and install nuts. Install two bolts in each pair of spring plates (Ref. Fig. 403).

For slip joint assemblies having spring plate assemblies (14 places), install two bolts in each pair of spring plates (Ref. Fig. 403).

(b) Install five bearing strips, centering the first at top centerline. Install four additional bearing strips alternating left and right.

NOTE: Bearing strips are available in two thicknesses (0.280 and 0.240 inch). The thick strips are to be installed until it becomes impossible to insert in position. The thin strip may be used at remaining location(s).

(c) Check bearing strip clearance (Ref. Fig. 403).

NOTE: With 5 bearing strips installed, check gap at end of the two lower bearing strips, and at lower centerline. Measurement is taken between rub strip and ring, subtracting from this dimension thickness of bearing strip at each location. The gap at each location is 0.005 to 0.050 inch.

(d) Install sixth bearing strip.

(e) Place seal assembly in position (against bearing strips) with each end terminating at bottom centerline of slip-joint assembly.

(f) Install all seal retainers (at original positions) except the one at bottom centerline.

NOTE: Verify that clearance exists between the seal retainer notched area and the spring assemblies.

(g) Trim ends of seal, as required, to butt against seal plug flange within 0.00 to 0.060 inch. Seal plug flange shall be located at bottom centerline within 1/2-inch, left or right (Ref. Fig. 403).

NOTE: If the original seal assembly is reinstalled, check that the same dimensions exist.

(h) Verify that ends of bearing strips and seal retainers do not align. Readjust bearing strips to preclude this condition.

(i) Install last seal retainer and verify that all seal retainer bolts are tightened.

(j) Check that forward and aft mating surfaces (bolted joints) are clean. Do not apply sealant to mating surfaces.

(2) With block and tackle located in area above aft segment, and with 2 X 4 timbers and/or other protective material on workstand, move center segment from floor to workstand. Assure that stabilizer box section is protected.

(3) Install ropes or equivalent around center segment and attach to block and tackle.

(4) Carefully move center segment forward along 2 X 4 timbers. When required, relocate block and tackle

forward to area above center segment installed position. Continue forward and upward movement of center segment to position of mating with S-duct forward segment.

NOTE: If interference is encountered between the center segment forward ring and the canted bulkhead ring at FS 1860, the forward ring width may be temporarily reduced by deflecting the sides toward the S-duct vertical centerline a total maximum of 1.25 inches. It is recommended that a turnbuckle and cable device be used, attaching to two end plates bolted to forward flange at minimum of two places each. Plates to be located parallel to and approximately 8 inches above horizontal centerline of S-duct. Remove device when appropriate.

(5) Align forward and center segments, and install flange bolts.

(6) Install support rods (3) and adjust as required to a
R no-load condition. Check witness holes or perform
R measurement for proper thread engagement (Ref. Fig.
R 403, Sheet 1). Lock-wire nuts to tabs.

NOTE: If original rod adjustments were not disturbed, reinstall (if possible) without disturbing adjustment. If original adjustments were lost, vary length as required to obtain a no-load condition.

It is possible that further adjustment may be required, if the air intake adapter does not align properly with engine fan case and with S-duct aft segment ring at canted bulkhead.

(7) In area above center segment, install No. 2 engine anti-icing duct (Ref. Fig. 402, and 70-12-02).

(8) In area above center segment, install two lines which attach to P1 sensor probe (Ref. Fig. 402) as follows:

(a) Install short line which connects P1 sensor probe to No. 2 engine anti-icing duct.

(b) Install P1 pressure line which runs to No. 2 engine. Connect line at P1 sensor probe and to fitting located on forward side of canted bulkhead, FS 2011.

(c) At P1 sensor probe, lock-wire two nuts together.

NOTE: If any electrical wires were disconnected for convenience during the removal procedure, verify that all wires have been reconnected.

(9) Shore aft end of center segment and remove ropes. Relocate block and tackle to area above aft segment.

(10) Check that aft segment forward and aft mating surfaces (bolted joints) are clean. Do not apply sealant to mating surface.

(11) Assure that 2 X 4 timbers are in position. Position aft segment on workstand in proper alignment for installation.

(12) Wrap ropes around aft segment, as required, and attach to block and tackle. Take up slack as aft segment slides forward on 2 x 4 timbers.

(13) Slide aft segment forward into mating position, and assure that mating surfaces are in proper alignment.

(14) Install bolts in flange joint at forward end of aft segment.

(15) Install drain valve in boss (located at lower aft end of aft segment).

(16) While supporting aft segment with block and tackle, remove shoring from aft end of center segment. Shore aft end of aft segment, as required, during installation of firewall seal assembly.

(17) Install firewall seal assembly at aft segment aft ring and canted bulkhead ring (Ref. Fig. 401).

(18) At center segment forward joint and aft segment forward joint, from inside S-duct, apply bead sealant to fill inside gap at each joint. Apply only enough sealant to fill gap, leaving a smooth surface that will not disrupt air flow (Ref. 20-51-04).

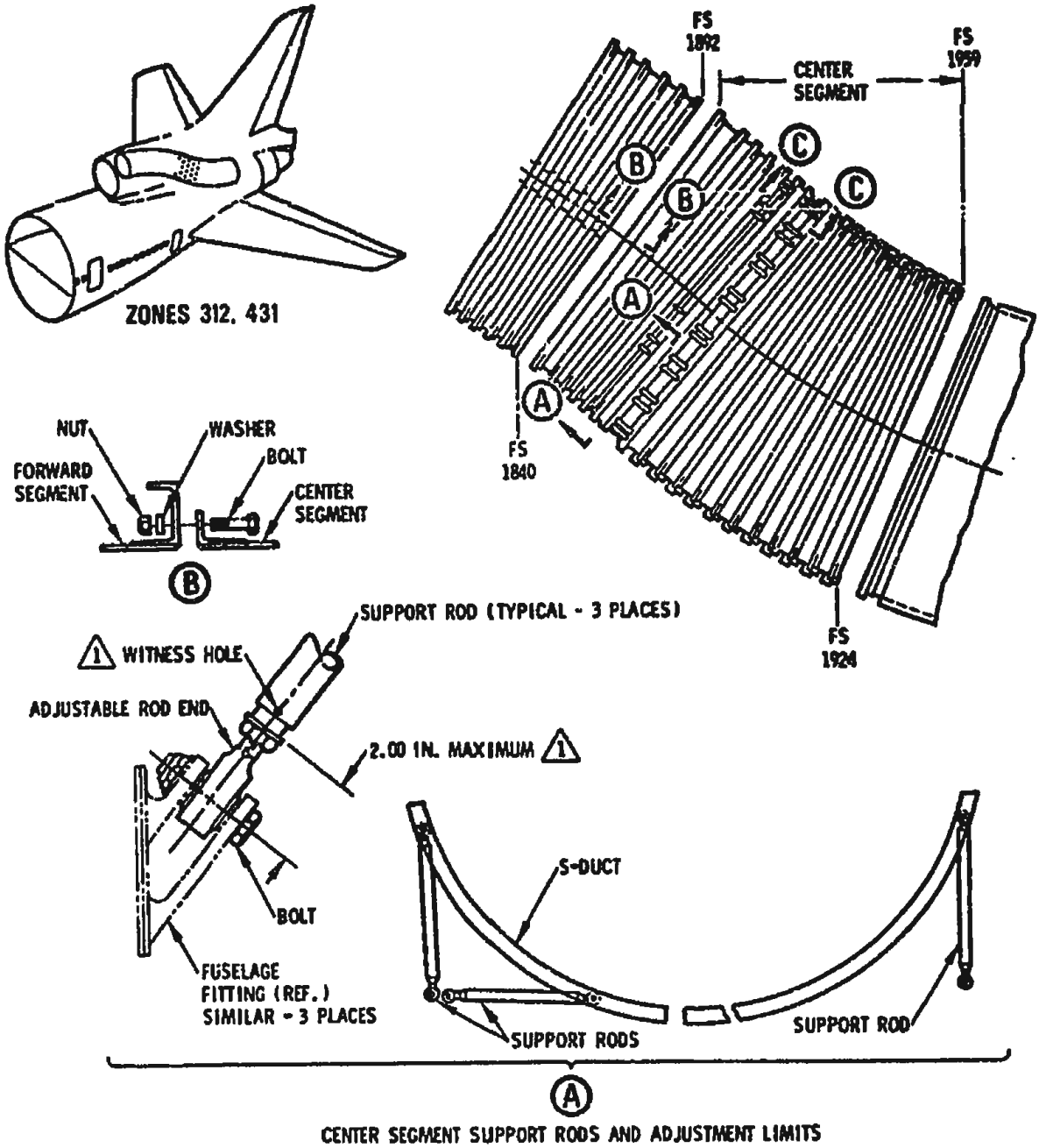
NOTE: Protect interior surface of S-duct with padding, or equivalent.

(19) Remove ropes, block and tackle, padding, shoring materials, timber, etc. from area forward of firewall seal assembly.

(20) Reinstall No. 2 engine and air intake adapter (Ref. 71-00-03).

(21) Close access doors 313FR, 318GL and 318GR.

R (22) Reactivate hydraulic power system which was deactivated in warning note (Ref. Paragraph 4A).



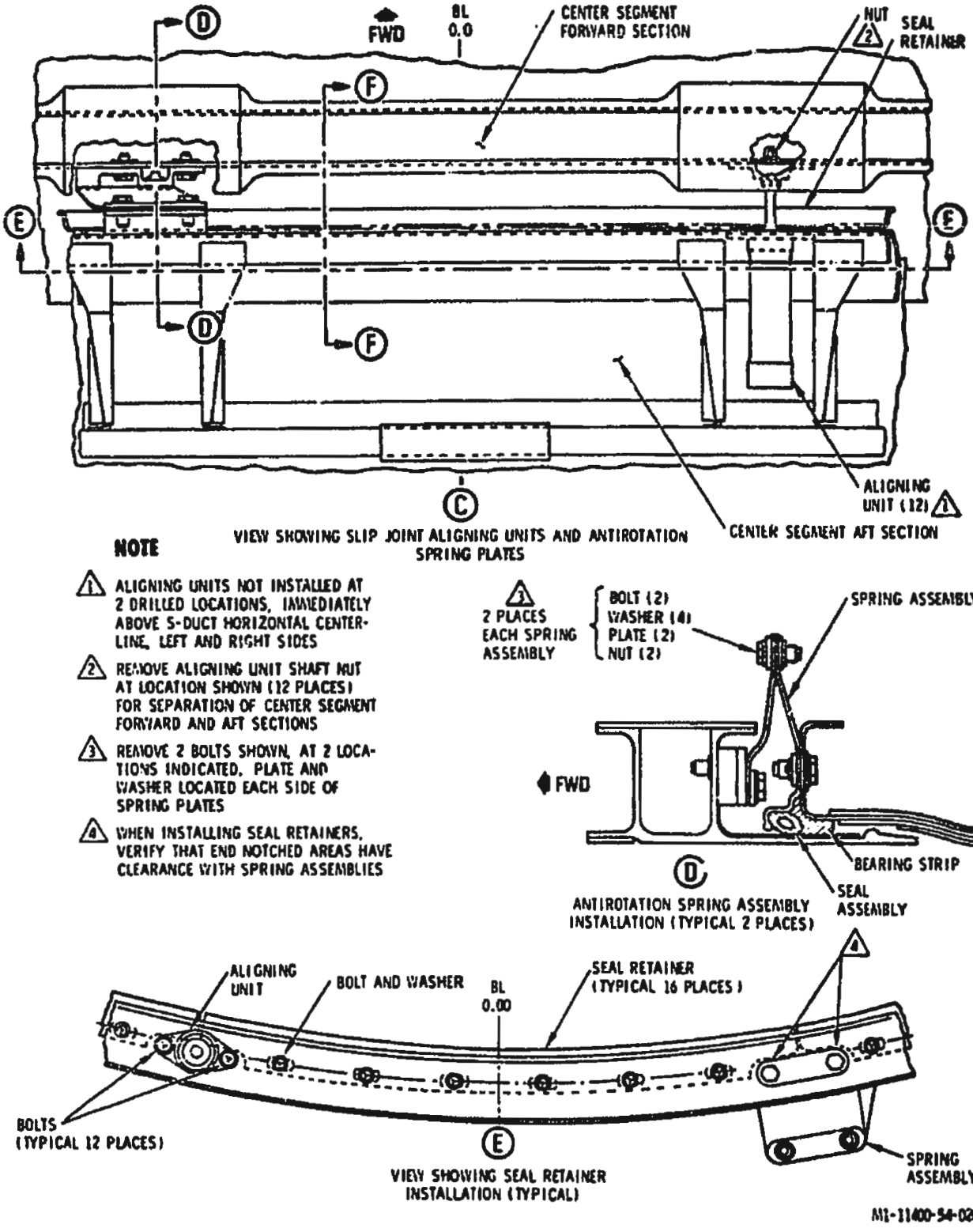
CENTER SEGMENT SUPPORT RODS AND ADJUSTMENT LIMITS

1 FOLLOWING ADJUSTMENT OF SUPPORT RODS, IF THREADS ARE NOT VISIBLE IN WITNESS HOLES, CHECK DIMENSION INDICATED. EITHER CONDITION IS SATISFACTORY.

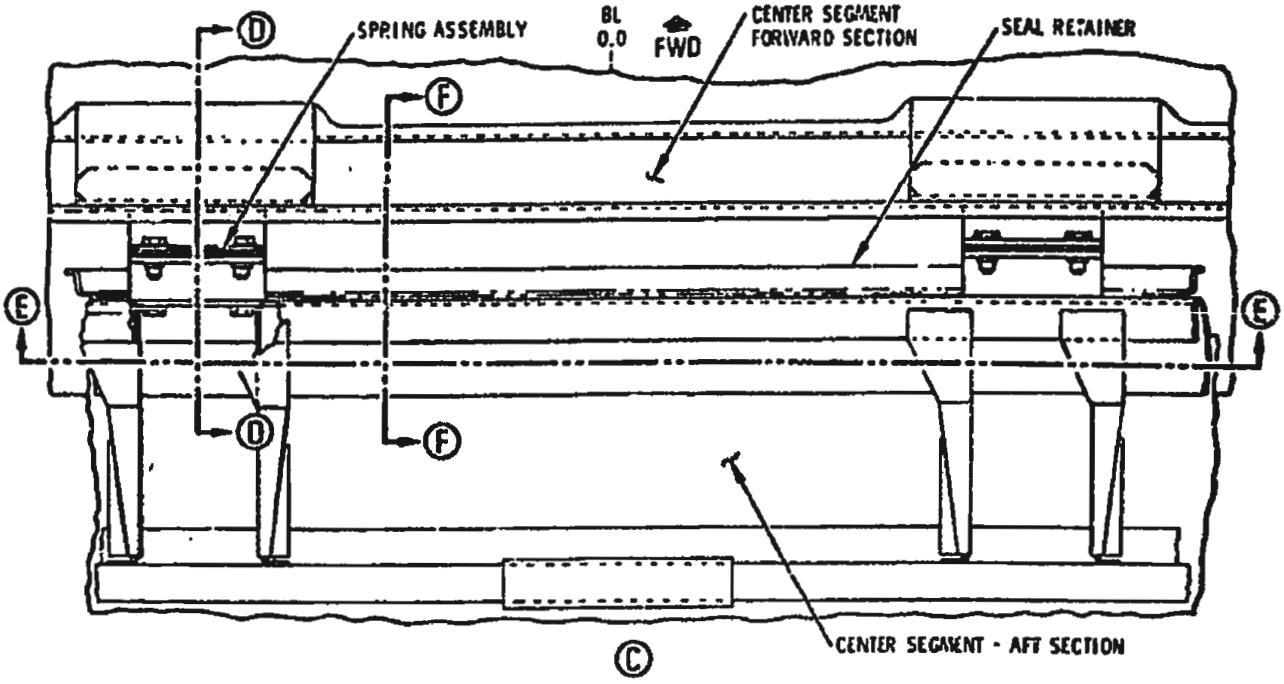
M1-0101-54-025

R Center Engine S-Duct - Removal and Installation
R Figure 403 (Sheet 1)

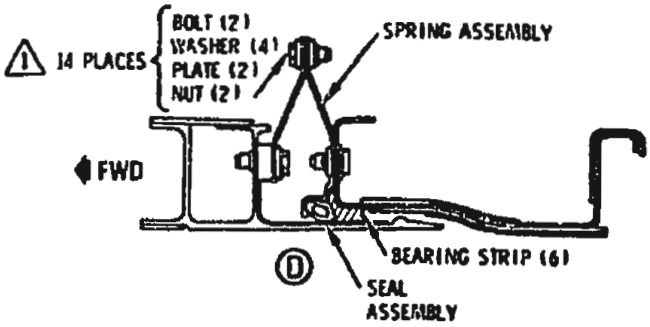
EFFECTIVITY: ALL


D
FWD
BL 0.0
CENTER SEGMENT FORWARD SECTION
NUT (2)
SEAL RETAINER
F
E
E
D
F
C
ALIGNING UNIT (12) 1
CENTER SEGMENT AFT SECTION
VIEW SHOWING SLIP JOINT ALIGNING UNITS AND ANTIROTATION SPRING PLATES
NOTE
1 ALIGNING UNITS NOT INSTALLED AT 2 DRILLED LOCATIONS, IMMEDIATELY ABOVE S-DUCT HORIZONTAL CENTERLINE, LEFT AND RIGHT SIDES
2 REMOVE ALIGNING UNIT SHAFT NUT AT LOCATION SHOWN (12 PLACES) FOR SEPARATION OF CENTER SEGMENT FORWARD AND AFT SECTIONS
3 REMOVE 2 BOLTS SHOWN, AT 2 LOCATIONS INDICATED, PLATE AND WASHER LOCATED EACH SIDE OF SPRING PLATES
4 WHEN INSTALLING SEAL RETAINERS, VERIFY THAT END NOTCHED AREAS HAVE CLEARANCE WITH SPRING ASSEMBLIES
3 2 PLACES EACH SPRING ASSEMBLY
BOLT (2)
WASHER (4)
PLATE (2)
NUT (2)
SPRING ASSEMBLY
FWD
BEARING STRIP
SEAL ASSEMBLY
D
ANTIROTATION SPRING ASSEMBLY INSTALLATION (TYPICAL 2 PLACES)
ALIGNING UNIT
BOLT AND WASHER
BL 0.00
SEAL RETAINER (TYPICAL 16 PLACES)
4
BOLTS (TYPICAL 12 PLACES)
E
SPRING ASSEMBLY
VIEW SHOWING SEAL RETAINER INSTALLATION (TYPICAL)
MI-11400-54-026

Center Engine S-Duct - Removal and Installation
Figure 403 (Sheet 2)

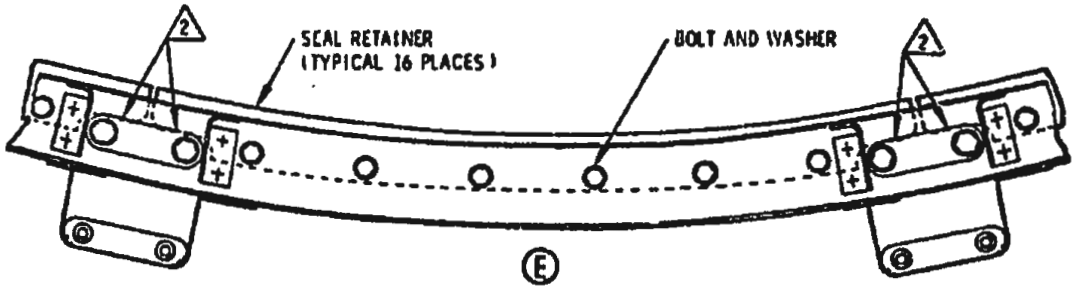


VIEW SHOWING SLIP JOINT ASSEMBLY



NOTE

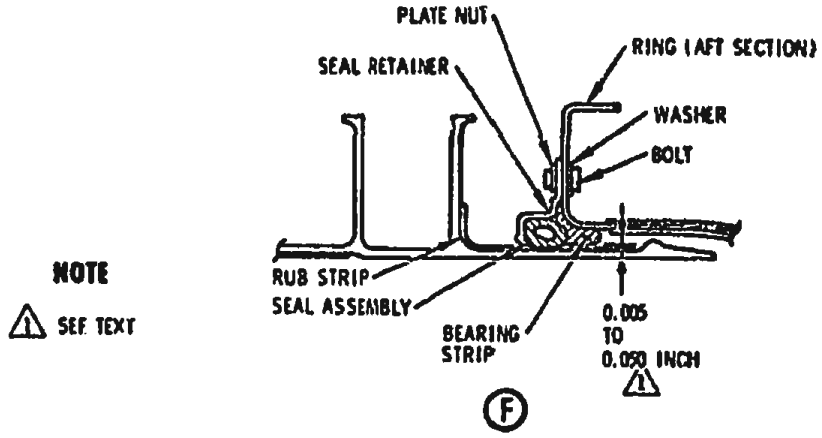
1. REMOVE 2 BOLTS SHOWN AT EACH OF 14 LOCATIONS. PLATE AND WASHER LOCATED EACH SIDE OF SPRING PLATE
2. WHEN INSTALLING SEAL RETAINERS, VERIFY THAT END NOTCHED AREAS HAVE CLEARANCE WITH SPRING ASSEMBLIES



ROTATED 180°

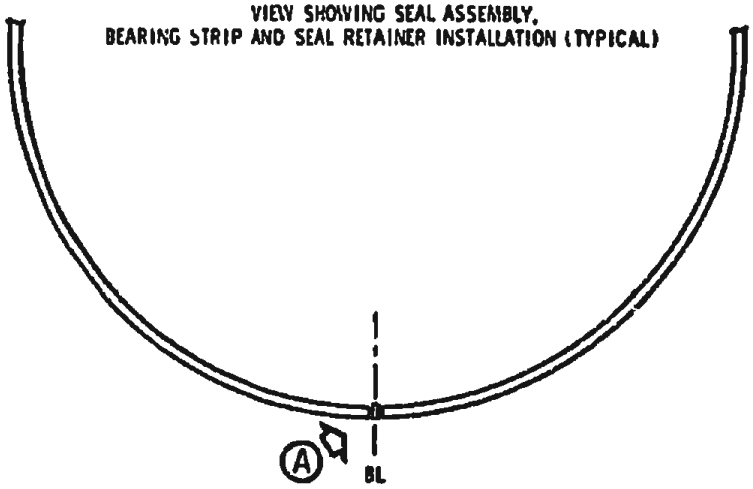
M1-2000-54-027

Center Engine S-Duct - Removal and Installation
Figure 403 (Sheet 2)

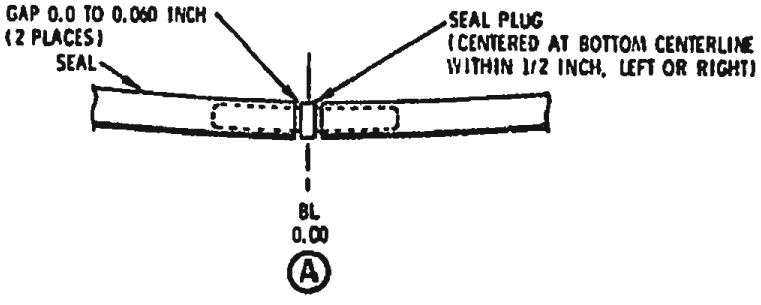


(F)

VIEW SHOWING SEAL ASSEMBLY, BEARING STRIP AND SEAL RETAINER INSTALLATION (TYPICAL)



SLIP-JOINT SEAL ASSEMBLY



M1-0100-54-028

Center Engine S-Duct - Removal and Installation
Figure 403 (Sheet 3)

R APPLICATION OF EROSION RESISTANT COATING ON INTERIOR OF S-DUCT
R CLEANING AND PAINTING

R 1. General

R This application is to reduce the possibility of pitting and
R corrosion of the "S"-Duct inner skin from FS1641 to FS1959. The
R inner surfaces of the center engine inlet are cleaned, primed
R and painted with an erosion resistant coating.

R 2. Equipment and Materials

R Empennage Maintenance Workstand, SK 9-23-71, Alad Corp, or
R equivalent

R S-duct Protective Liner, BA99-101, or equivalent

R Jet Exhaust Venturi Blower, McMaster Carr, Chicago Illinois, or
R equivalent

R Industrial Belt, 7929T1, McMaster Carr, Chicago Illinois, or
R equivalent

R Safety Line, 7930T20, McMaster Carr, Chicago Illinois, or
R equivalent

R Ambient Air Breathing Pump, Rhine Air Inc., Santee California,
R or equivalent

R Airline Respirator, W286-50, St. Paul Minnesota, or equivalent

R S-Duct Access Step, Drawing No. L1011-T-72, Hong Kong Aircraft
R Engineering Co. LTD., or equivalent

R Alodine 1200S [MIL-C-81706(1), Class 1A], Amchem Products Inc.,
R Ambler, Pennsylvania, or equivalent

R Chemglaze M213, Hughson Chemical Co., Erie, Pennsylvania, or
R equivalent

R Cleaner, 934-66 (LCM 32-1086), Leeder Chemicals Inc., La Mirada,
R California, or equivalent

R Primer, 02-GN-28, (LCM 37-1035) Deft Inc., Chemical Coating
R Div., Torrance, California, or equivalent

R Cleaner, 742B (LCM 32-1248), Penwalt Corp., Los Angeles,
R California, or equivalent

R 3. Reference Procedure

R	6-40-00	Exterior Access Doors and Removable Panels
R	6-50-00	Interior Access Door and Removable Panels
R	20-77-03	Lockheed Overhaul Manual
R	29-11-00	Hydraulic Power Systems
R	54-26-00	Center Engine S-duct - Removal and Installation
R R	71-00-03	Fuselage - Mounted GEC Unit (Engine No. 2) - Removal and Installation

R 4. Cleaning and Painting

R A. Cleaning

R WARNING: ENSURE ALL FOUR HYDRAULIC SYSTEMS ARE SHUT OFF (REF. 29-11-00). TAG FLIGHT ENGINEER/SECOND OFFICERS HYDRAULIC SYSTEM PANEL, ZONE 215, AND THE HYDRAULIC SERVICE PANEL, ZONE 147.

R (1) Gain access to center engine air inlet through S-duct inlet, access door 318GL (Ref. 6-40-00) and access door 431AZ (Ref. 6-50-00).

R (2) Remove number two engine (Ref. 71-00-03).

R (3) Remove S-duct adapter (Ref. 54-26-00).

R (4) Ventilate S-duct with Venturi Blower to ensure adequate airflow.

R WARNING: PROVIDE PERSONNEL WITH OUTSIDE AIRSUPPLY WHEN USING CHEMICALS OR PAINT INSIDE DUCT. FILTER MASK IS NOT ACCEPTABLE.

R (5) Enter S-duct inlet using Empennage Maintenance Workstand (Ref. Fig. 701).

R NOTE: Use Empennage Maintenance Workstand as fixed base for working.

R (6) Unroll S-duct Protection Liner inside duct.

R NOTE: Use Industrial Belts and Safety Line to guide personnel inside duct. Also use S-duct Access Step when extended reach is required (Ref. Fig.

R 701). Securing lines are controlled by person
R stationed on Empennage Maintenance Workstand.

R (7) Mask off area not to be painted (Ref. Figure 701).
R Assure that no cleaning or paint materials will enter
R engine area or fuselage exterior.

R CAUTION: MASK OFF HOT AIR DEICING SLOTS AT FORWARD SECTION
R (FS1641.5) OF DUCT INLET AND AT ARTICULATING JOINT
R TO PREVENT PAINT FROM ENTERING.

R (8) Repair any S-duct area having surface corrosion, (Ref.
R Structural Repair Manual 51-21-01 and L-1011 Tristar
R Corrosion Prevention Guide).

R (9) Treat all surfaces as follows:

R WARNING: PROPER VENTILATION MUST BE PRESENT WHEN USING
R CLEANING SOLUTIONS TO PROTECT PERSONNEL FROM
R TOXIC VAPORS.

R (a) Wash surfaces to be painted with No. 934-66
R Cleaner, or equivalent (Ref. Fig. 702). Apply
R with clean cloths followed immediately by wiping
R dry with clean cloths.

R (b) Apply Pennwalt 742B Cleaner, or equivalent, to
R surfaces using clean cloths, fiber brushes, or
R synthetic sponges. Agitate cleaner on the
R surfaces during a 4-to-6 minute dwell time. Do
R not allow cleaner to dry on surfaces. Thoroughly
R spray rinse with water before surfaces dry.

R (c) Brush apply alodine colored chemical film
R treatment (Ref. Lockheed Overhaul Manual
R 20-77-03). During the rinse operation, monitor
R for water break-free surface. If water break-free
R (free from beads) surfaces cannot be attained,
R repeat Steps 4A(9)(a) through 4A(9)(c). While
R surfaces are still wet from the rinsing operation,
R check surface condition with Hydrion paper. The
R surfaces should be neutral or slightly acid (pH
R 6.0 to 7.0). If an acid condition less than 6.0
R pH exists, re-rinse surfaces with water as
R required and recheck. Allow chemical film treated
R surfaces to completely dry for 2 hours minimum to
R 12 hours maximum at 70°F (21°C) minimum before
R applying primer.

R B. Painting

R WARNING: ALL PRECAUTIONS NORMALLY USED IN MIXING AND
R APPLYING ORGANIC COATINGS MUST BE OBSERVED. WHEN
R MIXING AND APPLYING COATING AVOID PROLONGED
R BREATHING OF VAPOR OR CONTACT WITH SKIN. PROVIDE
R ADEQUATE VENTILATION. DO NOT USE NEAR OPEN FLAMES
R OR SPARKS. ALWAYS WASH HANDS THOROUGHLY BEFORE
R EATING.

R (1) Apply one coat of 02-GN-28 Primer, or equivalent.

R NOTE: Erosion resistant topcoat must be applied after
R primer has dried 30 minutes to 24 hours at 65°
R to 90°F (18° to 32°C).

R For chemglaze application, a walkway
R approximately 18 to 24 inches wide can be masked
R off using plastic sheet. The remainder of the
R duct can then be painted followed by completion
R of the walkway.

R (2) Thoroughly mix Chemglaze M213 (white) erosion resistant
R topcoat in the ratio of two parts resin to one part
R curing agent. Mix only enough material for each
R application as the catalyzed material has a pot life of
R approximately two hours.

R NOTE: Mix topcoat for first coat, thinner (but must
R not run when applied) than required above, to
R obtain a base for subsequent coats.

R Erosion resistant coating must be applied in an
R area protected from weather and dust.
R Temperature during application and cure shall be
R 65° to 95°F (18° to 32°C).

R (3) Spray erosion resistant topcoat using a multiple pass
R technique with each pass 90 degrees to the previous to
R obtain a thickness of 2 to 3 mils dry film thickness
R per application (4 to 5 mils wet film). Apply
R successive coats when the previous coat is
R dry-to-touch, but not tack-free. This condition
R requires approximately one to two hours at 65° to 95°F
R (18° to 32°C). Apply sufficient coats to obtain a
R total dry film thickness of 10 to 13 mils (usually four
R coats).

R NOTE: The complete coating application should be made
R without delays of more than four hours between
R coats.

R (4) Cure the completed erosion resistant coating system a
R minimum of seven days at 65° to 95°F (18° to 32°C)

R before exposure to fluids or erosion conditions. As an
R alternate, final cure may be achieved by force curing
R at 150° to 200°F (66° to 93°C) for six hours after two
R hours at 65° to 95°F (18° to 32°C).

R (5) Inspect coating system for detrimental defects such as
R blisters, pin holes, fisheyes, or cracks. Surface
R discrepancies that do not affect the overall appearance
R quality are acceptable. Touch up defects as follows:

R WARNING: PROPER VENTILATION MUST BE PRESENT WHEN USING
R CLEANING SOLUTIONS TO PROTECT PERSONNEL FROM
R TOXIC VAPORS.

R (a) Scuff-sand the area or cut away the defect and
R clean with No. 934-66 Cleaner, or equivalent.

R (b) Recoat the cleaned area by spray or brush
R application to obtain a blended, uniform coating.

R NOTE: White erosion resistant coating will fade to a light
R yellow beige upon aging or exposure to sunlight. This
R change is unavoidable due to the polyurethane resin
R system used. Color differences from touch-up areas are
R acceptable.

R (6) Test coating system for adhesion after coating system
R has cured in accordance with Step 4B(4) using dry type
R method as specified in FED-STD-141, Method 6301, except
R the surface shall not be scribed.

R (7) Check thickness of coating system with a micrometer, or
R equivalent.

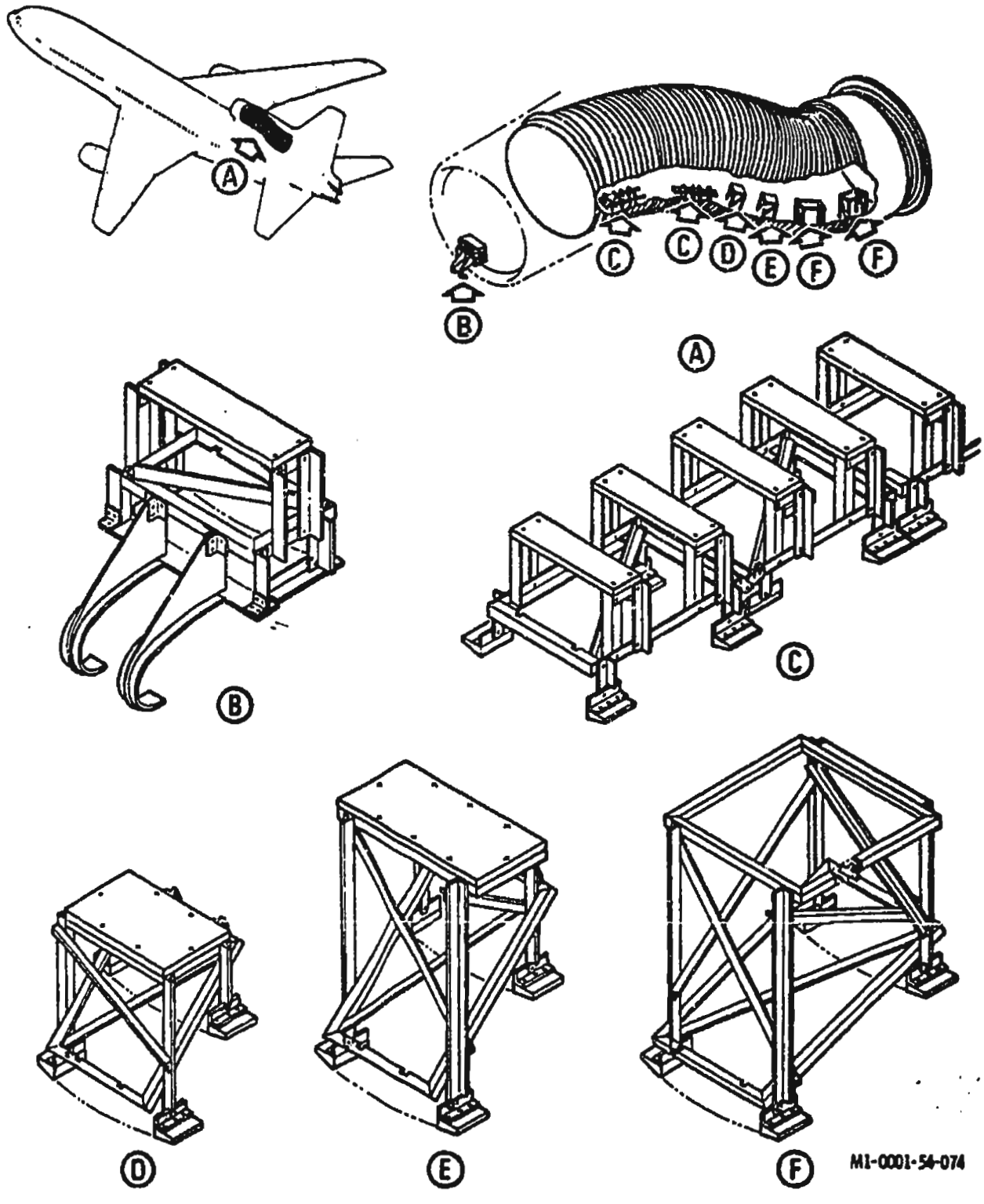
R NOTE: The adhesion test and thickness measurements may
R be accomplished on either the actual parts or
R test panels coated concurrently with aircraft
R S-duct.

R (8) Remove all masking materials.

R (9) Remove all foreign objects from S-duct.

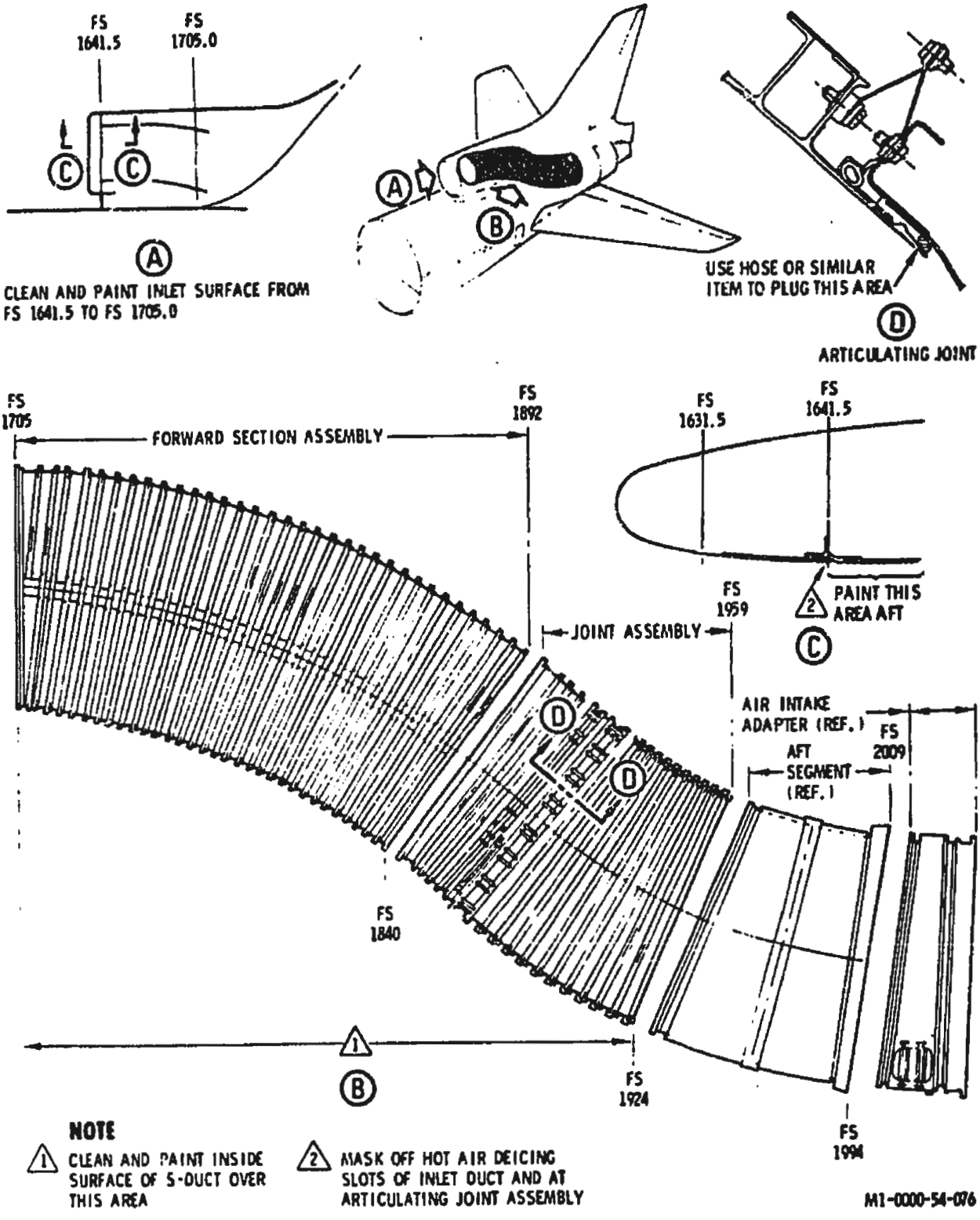
R (10) Reinstall S-duct adapter (Ref. 54-26-00).

R (11) Reinstall No. 2 engine (Ref. 71-00-03).



R S-Duct Access Stand, HAECO
R Figure 701

R EFFECTIVITY: ALL
R
001B



R S-Duct Erosion Resistant Paint Application
R Figure 702

R EFFECTIVITY: ALL
R
001B

R # S-DUCT DOOR - REMOVAL AND INSTALLATION

R 1. General

R The S-duct door is located on the lower left side of the
R S-duct-to-engine segment assembly (adapter) in zone 431.

R 2. Referenced Procedures

R 52-71-00 Door Warning System - Adjustment and Test

R 71-12-01 LH and RH Lower Hinged Cowls - Servicing

R 3. Removal/Installation

R A. Removal

R (1) Open LH lower hinged cowl (Ref. 71-12-01).

R (2) Press latch release buttons and open two latches at
R lower end of S-duct door.

R (3) Remove nut and washer at each upper hinge fitting (Ref.
R Fig. 401).

R (4) While supporting door, remove hinge bolt and washer at
R each upper hinge fitting.

R B. Installation

R NOTE: This procedure is based on the installation of a new
R door.

R The inboard perforated skin of a new replacement (spare)
R S-duct door is delivered untrimmed, and must be trimmed and
R adjusted to meet gap and mismatch requirements, at time of
R door installation.

R (1) Trim S-duct door to S-duct opening as follows:

R (a) Install door into door opening of S-duct-to-engine
R segment assembly.

R (b) Align door hinges with segment hinge fittings and
R install hinge bolts without washers or nuts.

R (c) Tag engine number 2 ENGINE START panel
R switchlight. On Flight Engineer/Second Officers

aft circuit breaker panel CB3, zone 215, open and tag START AIR VALVE circuit breaker N9.

(d) Position workman inside S-duct to mark trim line.

(e) Close and latch S-duct door.

(f) Mark trim line on door perforated inner skin using door opening as guide.

(g) Remove door, and trim excess material until door will fit into door opening.

(h) Install S-duct door temporarily to check clearance gap around door inner skin. Fit and file to 0.020 to 0.040 inch gap. Smooth sharp edges as required.

(2) Apply Alodine to bare metal trim edges of door.

(3) Install S-duct door as follows.

(a) Engage door hinge fittings with hinge fittings at top of door opening and install bolts, washers and nuts.

NOTE: Washers are installed under bolt head and under nut.

(b) Nuts are installed loose with 0.001 to 0.006 inch clearance.

(c) Safety hinge bolt nuts with cotter pins.

(4) Adjust door inner skin mismatch as follows.

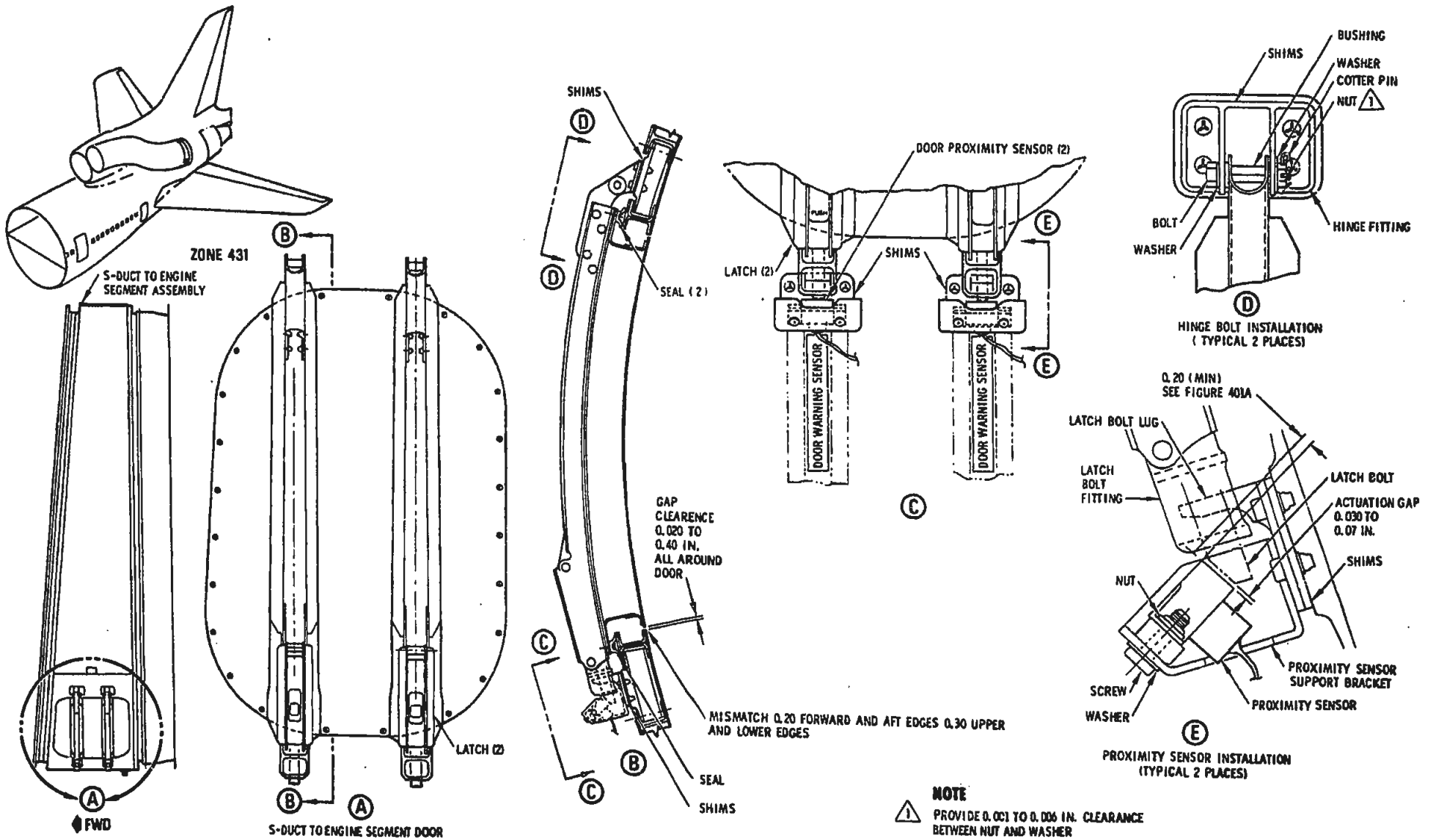
(a) Add or remove shims from under hinge fittings and/or under latch bolt lugs. Adjustment must be made with S-duct door closed (latch bolts engaged).

(b) Mismatch dimensions are 0.020 inch maximum along forward and aft edges of door inner skins, 0.030 inch maximum along upper and lower edges of door inner skin.

(5) Adjust proximity sensor as follows.

(a) Remove proximity sensor attaching screws.

R (b) Add or remove shims to obtain a gap of 0.030 to
R 0.07 inch between proximity sensor and face of



CR
CR

S-Duct Door - Removal and Installation
Figure 401

EFFECTIVITY: ALL

001B

latch bolt to effect correct operation of warning circuit (Ref. Fig. 401).

(c) Install proximity sensor attachment screws.

(d) Check for clearance gap of 0.20 minimum inch between upper corner of proximity sensor and lower surface of latch bolt fitting.

CR (6) If .20 min clearance between proximity sensor upper
CR corner and latch bolt fitting lower surface cannot be
CR obtained rework sensor support bracket as follows (Ref.
CR Fig. 401A):

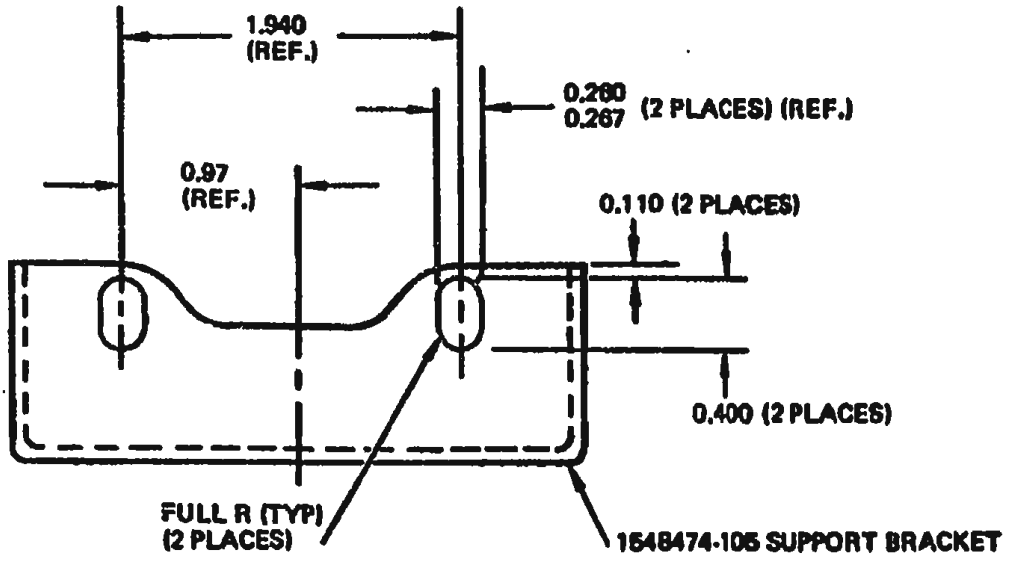
CR (a) Remove sensor bracket.

CR (b) Elongate the two existing .25 inch holes to .40
CR inch as shown above.

CR (c) Reinstall bracket.

CR (d) Adjust to obtain .20 min clearance per fig. 401.

R (7) Open, close and latch S-duct door to verify there is no binding or interference.



M1-0000-54-000

CR Proximity Sensor Support Bracket Hole Elongation
CR Figure 401A

R EFFECTIVITY: ALL
R
001B

R (8) Verify that S-duct door warning system is operating properly (Ref. 52-71-00, 501).

R (9) Close and latch S-duct door.

R (10) Close and latch lower hinged cowl (Ref. 71-12-01).

R (11) Close circuit breaker and remove tags installed in Step 3B(1)(c).

S-DUCT DOOR - APPROVED REPAIRS

1. General

This procedure provides information for replacement of the door latches and the door seal.

2. Referenced Procedures

52-71-00	Door Warning System - Adjustment and Test
54-26-01	S-Duct Door - Removal and Installation
71-12-01	LH and RH Lower Hinged Cowls - Servicing

3. Approved Repairs

A. Latches

R NOTE: The following procedure is applicable to either latch.

(1) Open LH lower hinged cowl (Ref. 71-12-01).

(2) Open S-duct door by operating two latches to open position.

(3) Remove S-duct door (Ref. 54-26-01).

(4) Remove door latch by removing two mounting bolts. Retain bolts, nuts and washers for reuse (Ref. Fig. 801).

(5) Temporarily install new latch by installing upper attachment bolt only.

NOTE: All new latches are provided with one predrilled mounting hole (upper). The lower mounting hole (nearest to latch pin) is drilled at time of installation.

R R R (6) Actuate latch to engage pin in fitting on door. Insert shim stock (0.005 to 0.010 inch thick) around latch pin to center pin in holes in fitting.

R R (7) Mark location of lower bolt attachment hole, using hole in latch mount strap as a guide. Remove shim stock.

(8) Remove latch from door and line drill holes (0.193 to 0.199 inch).

(9) Reinstall latch by installing two bolts.

(10) Reinstall S-duct door (Ref. 54-26-01).

(11) Verify that gap, mismatch and proximity sensor dimensions are within limits. Make adjustments as required (Ref. 54-26-01, Removal/Installation).

(12) Close and latch S-duct door.

R (13) Verify that each latch warning light is operating (Ref.
R 52-71-00, Adjustment/Test).

R (14) Close and latch LH lower hinged cowl (Ref. 71-12-01).

B. Seal

(1) Open LH lower hinged cowl (Ref. 71-12-01).

(2) Open S-duct door by operating two latches to open position.

(3) Remove seal by removing 24 fasteners (screws, nuts and washers) and retainer. Retain all items for reuse.

(4) Nest retainer in new seal.

NOTE: The overall dimensions of the seal and retainer are approximately one inch wider at the bottom than at the top. Therefore, position seal and retainer correctly before attempting to align holes.

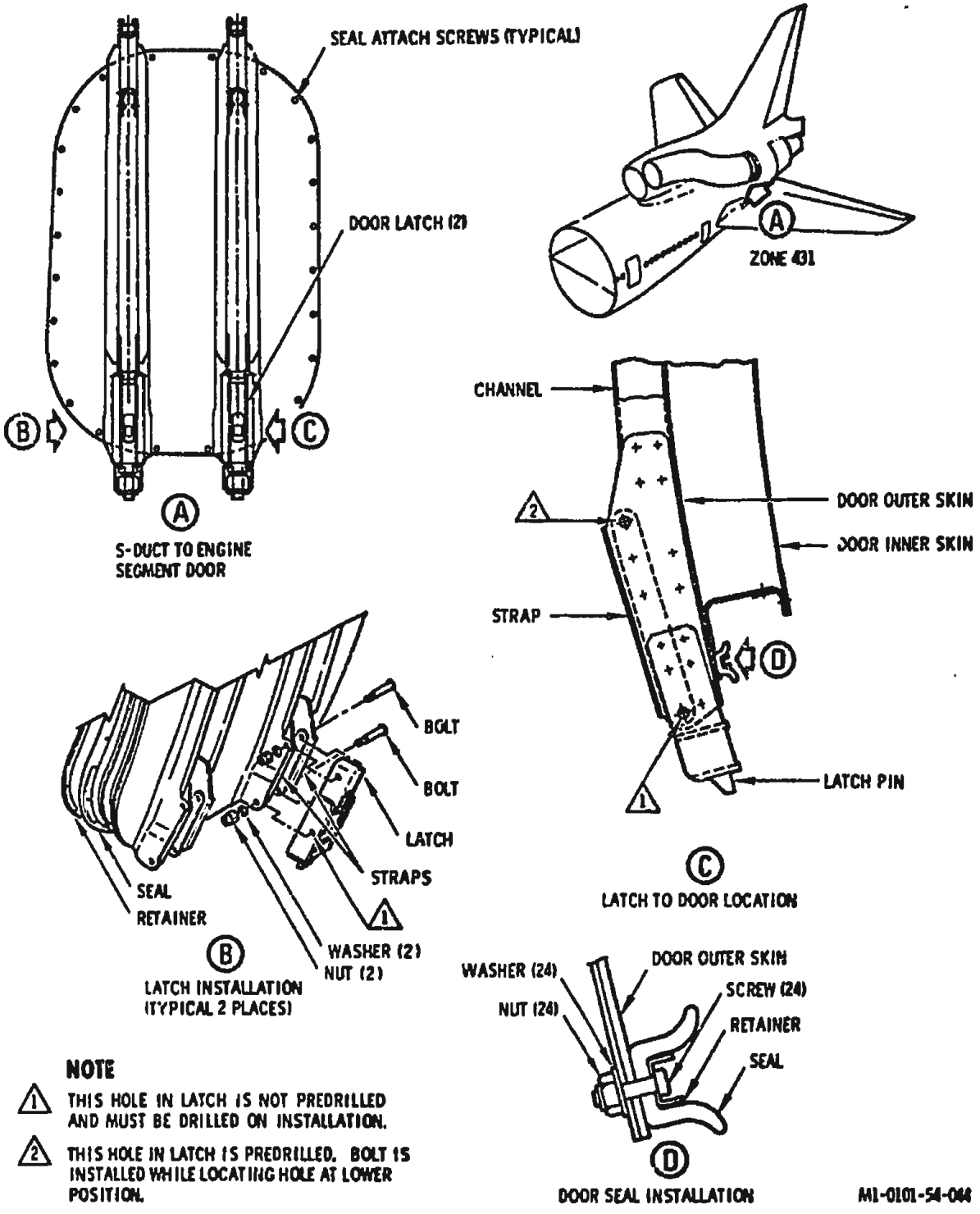
(5) Loosely install one screw at each side to support seal and retainer in position.

(6) Install remainder of screws and tighten evenly, moving from side-to-side and top-to-bottom.

(7) Close and latch S-duct door and then reopen to verify there is no interference.

(8) Close and latch S-duct door.

(9) Close LH lower hinged cowl (Ref. 71-12-01).



NOTE

1. THIS HOLE IN LATCH IS NOT PREDRILLED AND MUST BE DRILLED ON INSTALLATION.
2. THIS HOLE IN LATCH IS PREDRILLED. BOLT IS INSTALLED WHILE LOCATING HOLE AT LOWER POSITION.

R
R

S-Duct Door Latch and Seal Replacement
Figure 801

EFFECTIVITY: ALL

001B

FLEXIBLE VAPOR SEAL, CENTER ENGINE "S" DUCT - REMOVAL AND INSTALLATION

1. General

The flexible vapor seal for the number two engine isolates the engine compartment, which is a fire zone, from the afterbody of the airplane. A torn seal can permit vapor from the engine compartment to enter the unpressurized fuselage afterbody.

2. Description and Operation

Replacement of the damaged seal may be accomplished without removal of the engine. The air intake adapter is detached and removed from the "S" duct aft segment and the forward face of the engine fan case. The flexible vapor seal is detached and moved aft through the engine bay for removal. At this time, installation of the protective belt assembly is desirable.

Vapor seal damage is caused by the seal abrading on a tee-ring on the "S" duct. The protective belt assembly will prevent the flexible vapor seal from contacting the tee-ring.

3. Referenced Procedures

6-30-00	Zone Diagrams - Description and Operation
6-40-00	Exterior Access Doors and Removal Panels - Description and Operation
54-26-00	Center Engine "S" Duct - Removal and Installation
71-12-01	LH and RH Lower Hinged Cowls - Servicing
71-12-05	LH and RH Lower Hinged Cowls - Removal and Installation
71-12-07	Air Intake Adapter - Removal and Installation

4. Equipment and Materials

R Control Column and Trim Wheel Lock, G/ITEL 27-41-01, or
R equivalent

Belt Assembly - P/N 1619429-101 (Lockheed)

Flexible Vapor Seal - P/N 1506933-101 (Lockheed)

R Straps, Webbing, Woven nylon, Untreated (MIL-W-4088) 20 feet by
R 1 inch, (Eon Corp.), or equivalent

5. Removal/Installation

A. Removal

WARNING: ASSURE THAT ALL HYDRAULIC SYSTEMS ARE SHUT OFF. TAG FLIGHT ENGINEERS HYDRAULIC SYSTEM PANEL, ZONE 215, HYDRAULIC SERVICE PANEL, ZONE 147, AND BOTH ELEVATOR CONTROL COLUMNS, ZONE 210, TO ASSURE NO INADVERTENT ELEVATOR MOVEMENT. INSTALL CONTROL COLUMN LOCK (Ref. Fig. 403).

(1) Set trim at zero degree and install control column and trim wheel lock (Ref. Fig. 403)

CAUTION: DO NOT OPEN NO. 2 ENGINE UPPER COWL PANEL LATCHES IF CONTROL COLUMN AND TRIM WHEEL LOCK IS NOT INSTALLED.

(2) Open the No. 2 engine upper and lower cowl doors, 433AL, 434AR, 433DL and 434DR, to gain access to the aft face of the aft canted bulkhead firewall, zone 439 (Ref. 6-30-00, 6-40-00, 71-12-01, and 71-12-05).

(3) Remove engine air intake adapter, that mounts between aft end of "S" duct aft segment and forward face of engine fan case, zone 431, (Ref. 71-12-07, Ref. Fig. 401, Sheet 1).

(4) Remove outer and inner flame shield in accordance with 54-26-00. Mark and layout on a bench, all components of the flame shield, including shims, as they are removed to facilitate reassembly and maintenance of the specified clearances. Retain all screws and hardware for reinstallation (Ref. Fig. 401, Sheet 1, 2, 3 and 4).

(5) Using a soft, felt tipped pen, index the now visible interior surfaces and aft edges of the flexible vapor seal at various points to the canted bulkhead and the aft flange of the "S" duct as an aid to subsequent installation of the new seal.

(6) Remove the 3 bolts that attach each aligning bracket at the 3 and 9 o'clock positions. Remove 114 bolts that attach the inner and outer flame shield attach brackets and other parts to the canted bulkhead and "S" duct
R (Ref. 54-26-00).

NOTE: Identify all parts and brackets as to location to facilitate reinstallation and maintenance of clearances (Ref. Fig. 401, Sheet 1, 2, 3 and 4).

(7) Remove the metal retainer rings, and flexible vapor seal by separating the vapor seal from the structure around its inner and outer perimeter and sliding it aft into the engine bay.

B. Installation

NOTE: Refer to Paragraph 5C for installation details if the R Protective Belt is to be installed concurrent with installation of the Flexible Vapor Seal.

WARNING: ASSURE THAT ALL HYDRAULIC SYSTEMS ARE SHUT OFF. TAG FLIGHT ENGINEERS HYDRAULIC SYSTEM PANEL, ZONE 215, HYDRAULIC SERVICE PANEL, ZONE 147, AND BOTH ELEVATOR CONTROL COLUMNS, ZONE 210, TO ASSURE NO INADVERTENT ELEVATOR MOVEMENT. INSTALL CONTROL COLUMN LOCK (Ref. Fig. 403).

(1) Verify control column and trim wheel lock is installed [Ref. Step 5A(1)].

(2) Lay out the damaged flexible vapor seal, with its apex down, on a set of level work benches. Maintain installed diameter as closely as possible.

(3) Insert new flexible vapor seal into old seal, with the four seal splices aligned. Clamp new and old seal together at four or five points around the perimeter to maintain their relative positions.

(4) Transfer the index markings previously placed on the old seal to the new seal.

CAUTION: USE ONLY A SOFT TIPPED INK PEN AND DO NOT PENETRATE OR DAMAGE THE SURFACE OF THE NEW SEAL.

(5) Using old seal as a template, transfer the location of existing holes in the old seal to the new seal.

NOTE: Assure that all 15/32" aligning bracket attach holes at the 3 and 9 o'clock position are clearly marked.

(6) Unclamp the 2 seals and using a square, extend the bolt hole location marks on the new seal straight aft, over the aft end of the seal and slightly onto its inner surface.

(7) On the outer surface of the outer flange of the new flexible vapor seal, intersect each extended hole line with a line parallel to and .75 ±.03 inch forward of the aft (bulb) end of the seal. At each of the 57 intersections punch, or drill, using a short length of 1/4 inch inside diameter stainless steel tubing with one end beveled to a sharp cutting edge, a 1/4 inch diameter hole (Ref. Fig. 401, Sheet 2, 3 and 4, View D, E, F and G).

(8) On the outer surface of the inner flange of the new flexible vapor seal, intersect each extended hole line with a line parallel to and .44 to .50 inches forward of the aft (bulb) end of the seal. Do not apply this step to the 15/32" aligning bracket attach holes referred to in Step 4 above.

(9) At each of the 57 intersections, punch or drill a hole of 0.250 (±0.005, - 0.001) inches (Ref. Fig. 401, Sheet 2, 3 and 4, View D, F, G and K).

(10) At the extended aligning bracket hole lines, at the 3 and 9 o'clock positions, intersect the lines with a line parallel to and .50" to .56" forward of the aft (bulb) end of the seal. At each of the six intersections, (3 per bracket) punch or drill a 15/32 inch diameter hole (Ref. Fig. 401, Sheet 4, View H).

(11) Position the new seal, with its leading edge forward, at the aft face of the aft canted bulkhead.

(12) Slide the seal forward into the annular gap between "S" duct and aft canted bulkhead and insert the outer flange metal retaining ring section into position.

(13) Install the two uppermost outer flame shield attaching brackets. This secures flexible vapor seal in position at its top.

(14) Install the two bottommost outer flame shield attaching brackets and associated retaining ring section. This secures seal at its bottom.

CAUTION: TIGHTEN BOLTS TO A TORQUE OF 25 TO 30 POUND INCHES.

(15) Install remaining ring section and the other outer flame shield brackets in the exact locations from which they were removed. Install them sequentially at opposite positions around outer perimeter. Install the two aligning brackets at the 3 and 9 p'clock positions (Ref. 54-26-00, Ref. Fig. 401, Sheets 2, 3 and 4).

NOTE: Maintain alignment of previously made index markings.

(16) Insert inner flange metal retaining ring sections. Maintain alignment of index markings. Install in same manner described in Step 14 above (Ref. 54-26-00, Ref. Fig. 401, Sheets 2, 3 and 4).

(17) Install remaining components of inner and outer flame shields (Ref. 54-26-00, Ref. Fig. 401, Sheet 2, 3 and 4).

(18) Reinstall engine air intake adapter (Ref. 71-12-07).

(19) Close and secure No. 2 engine upper and lower cowl doors on right and left sides.

C. Installation of Protective Belt while Flexible Vapor Seal is Being Replaced.

A protective belt is installed around the periphery of the "S" Duct aft segment just forward of the firewall, between the segment ring and the flexible vapor seal.

(1) Place the 1619429-101 Belt assembly in position. Assembly may be installed from aft of the canted firewall through the area where the flexible seal is normally located (Ref. Fig. 1, Sheet 5, 6 7).

(2) Position belt assembly so that "D" rings are at lower right hand area of the aft segment assembly aft ring (Ref. Fig. 401, Sheet 5).

(3) Engage the belt assembly straps and "D" rings. Tighten straps to hold belt securely in place.

(4) Safely strap assemblies by knotting excess strap to itself. Two half hitches should be sufficient.

D. Installation of Protective Belt Assembly while Flexible Vapor Seal is in place.

A protective belt is installed around the periphery of the "S" Duct aft segment just forward of the firewall, between the segment ring and the flexible vapor seal.

WARNING: ASSURE THAT ALL HYDRAULIC SYSTEMS ARE SHUT OFF. TAG FLIGHT ENGINEER HYDRAULIC SYSTEM PANEL, ZONE 215, HYDRAULIC SERVICE PANEL, ZONE 147, AND BOTH ELEVATOR CONTROL COLUMNS, ZONE 210, TO ASSURE NO INADVERTENT ELEVATOR MOVEMENT INSTALL CONTROL COLUMN LOCK (Ref. Fig. 403).

(1) Verify control column and trim wheel lock is installed [Ref. Step 5A(1)].

(2) Gain access in the afterbody to the horizontal stabilizer box beam just forward of the firewall, through access panels 313FR and 317BB.

WARNING: UTILIZE SUITABLE PROTECTIVE MATS IN WORK AREAS.

(3) Obtain suitable pull straps long enough (approximately 20 feet) to reach from the lower center line of the "S" Duct, up the left hand side, over the top and down the right hand side (2 straps are required). 1.00 inch wide nylon straps were used for the initial installation.

(4) Position one man on the upper aft surface of the horizontal stabilizer on the left hand side of the "S" Duct with the belt assembly and the pull straps (Ref. Fig. 1, Sheet 5 and 6).

(5) Position the second man above the "S" Duct on the W.L. 328.941 longeron aft web (Ref. Fig. 401, Sheet 5).

(6) Pass the pull straps up the left hand side of the "S" Duct, aft of the APU duct and over the top of the "S" Duct to the man above the "S" Duct (Ref. Fig. 401, Sheets 5 and 6).

(7) Secure the two pull straps to the Belt Assembly "D" rings and drop the upper ends of the pull straps down the right hand side of the "S" Duct.

(8) Ensure that the pull straps are nestled in the forward side of the trough at the aft end of the aft segment assembly, inboard of the flexible vapor seal (Ref. Fig. 401, Sheet 7).

NOTE: A three foot stick may be used to push the straps into the trough.

CAUTION: DACRON SIDE OF BELT ASSEMBLY MUST BE AGAINST "S" DUCT.

(9) With tension on the pull straps from the right hand side, start to feed the 1619429-101 Belt Assembly into the aft segment assembly trough (Ref. Fig. 401, Sheet 5, 6 and 7).

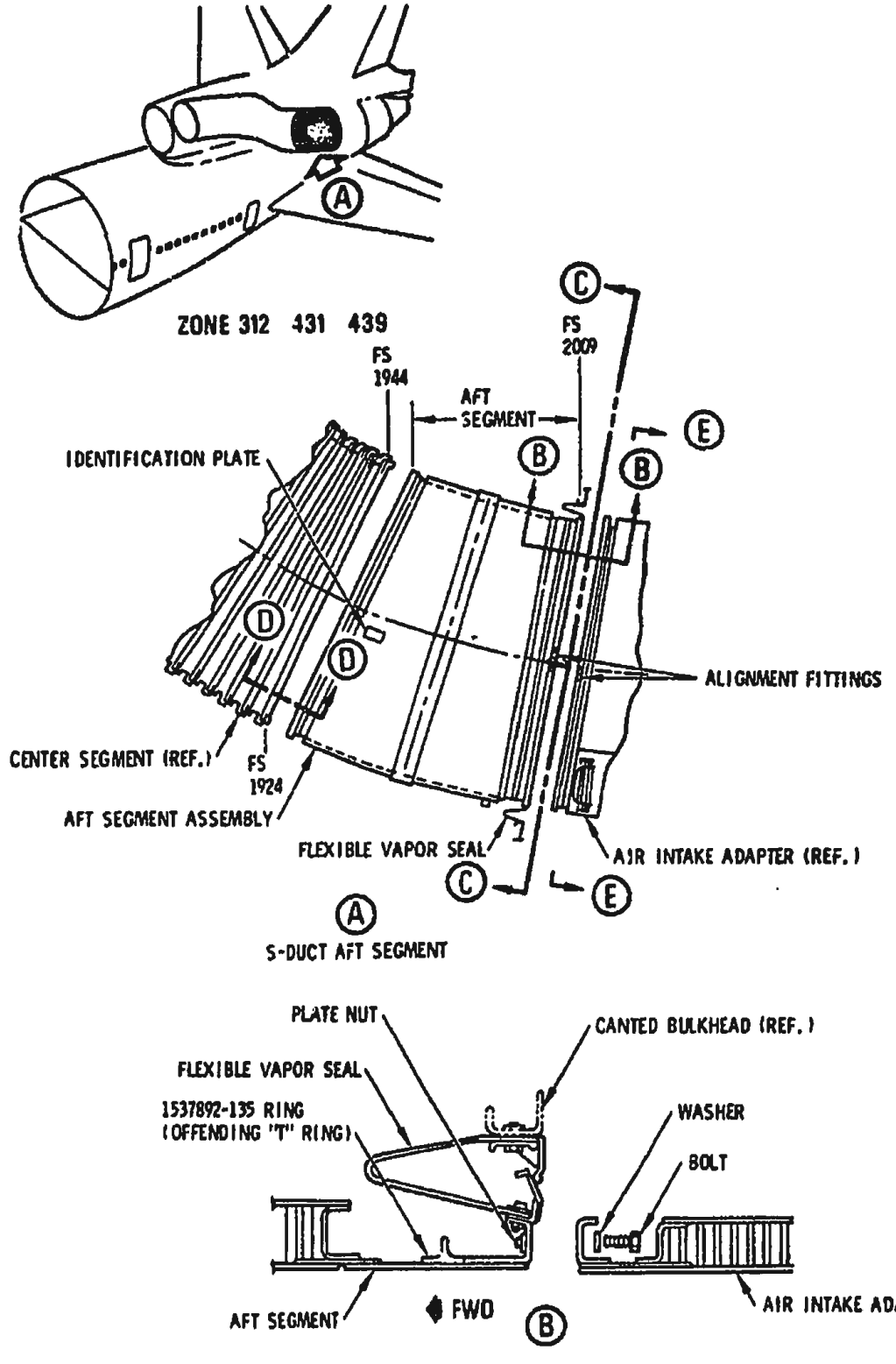
(10) After feeding the belt assembly into the trough, remove the pull straps, after the belt assembly has been

positioned so that the "D" rings are at the lower right hand area of the aft segment assembly aft ring (Ref. Fig. 401, Sheet 5).

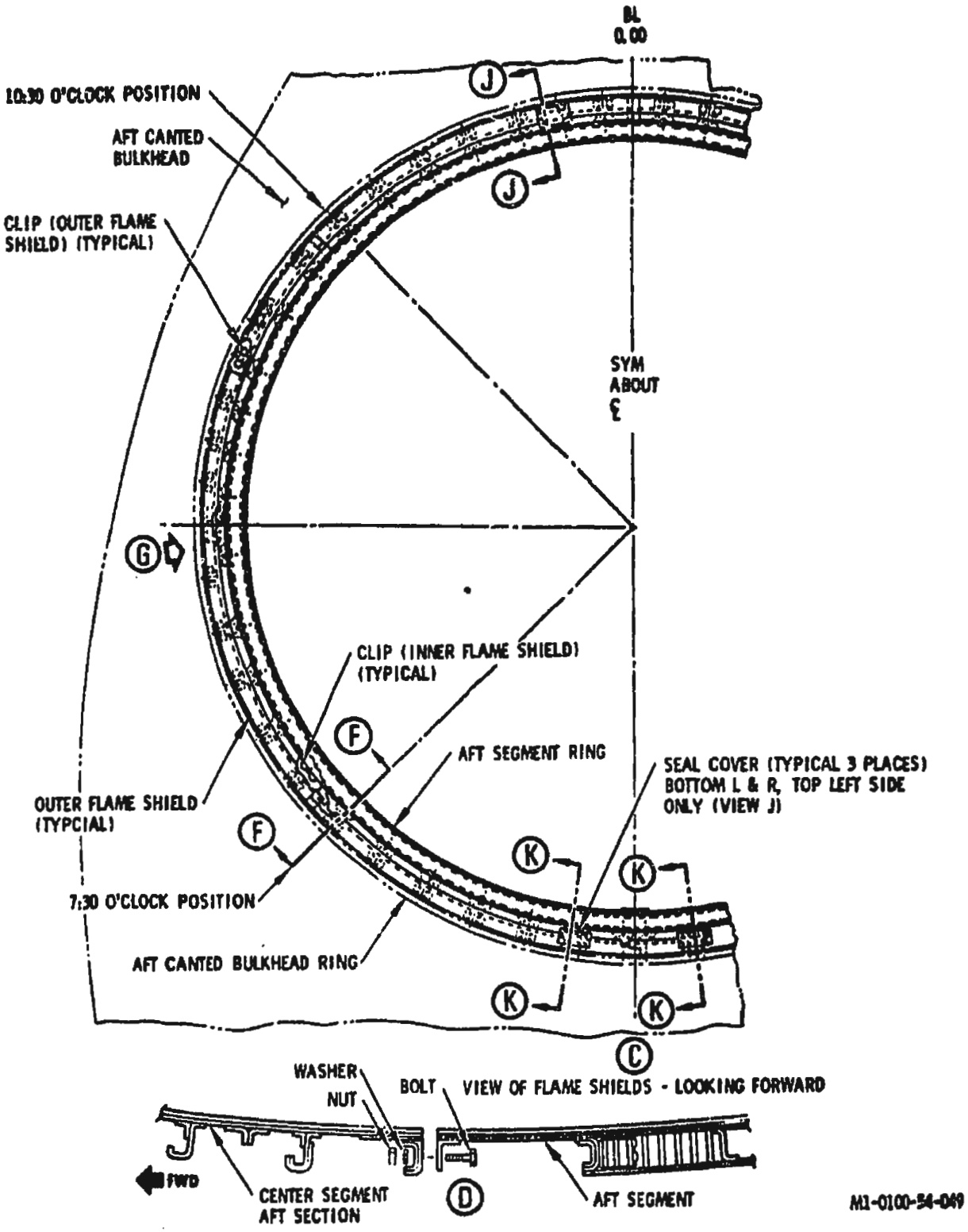
(11) Engage the belt assembly straps and "D" rings and double tie for security.

NOTE: Man positioned above "S" Duct may move below "S" Duct to assist in securing belt assembly straps to "D" rings.

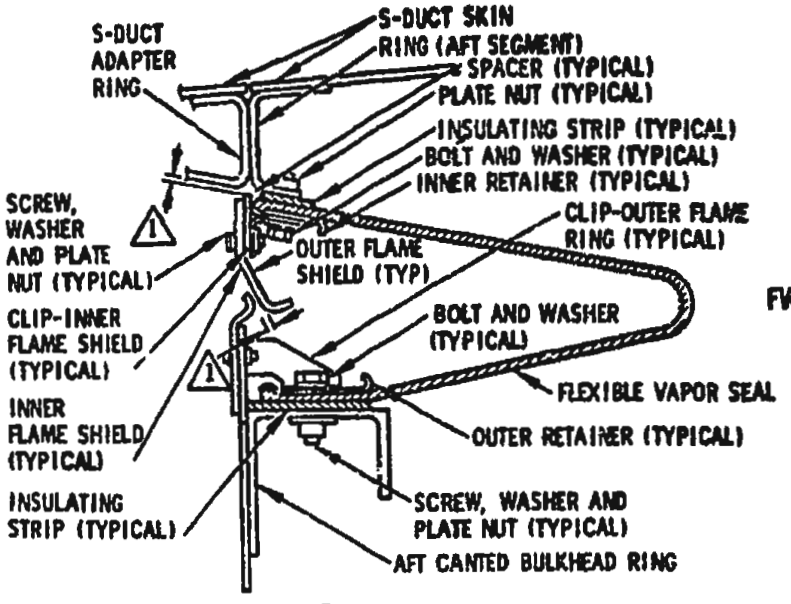
R (12) Close the access panels opened in Step D(2) above.



Center Engine "S" Duct - Flexible Vapor Seal Installation
Figure 401 (Sheet 1)

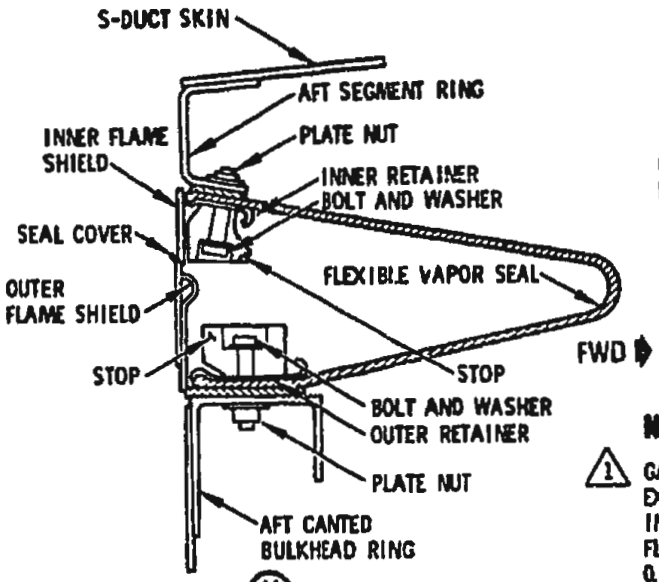


Center Engine "S" Duct - Flexible Vapor Seal Installation
Figure 401 (Sheet 2)



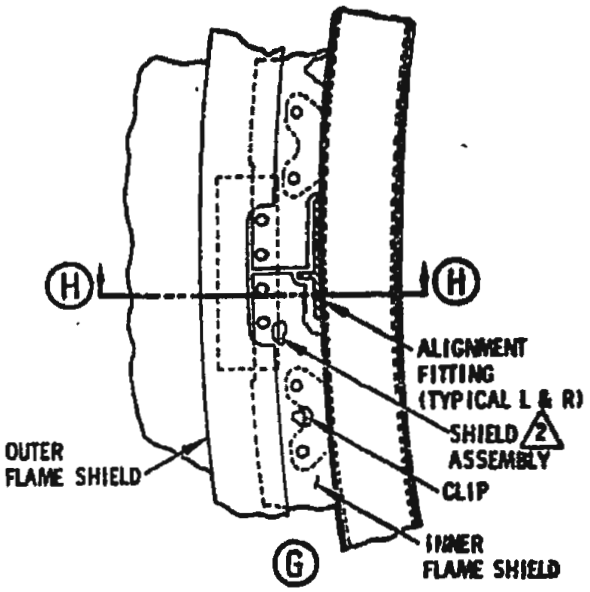
(F)

VIEW OF VAPOR SEAL AND FLAME SHIELD INSTALLATION (TYPICAL)



(K)

OPPOSITE OF (J) APPLICABLE TWO LOCATIONS ONLY



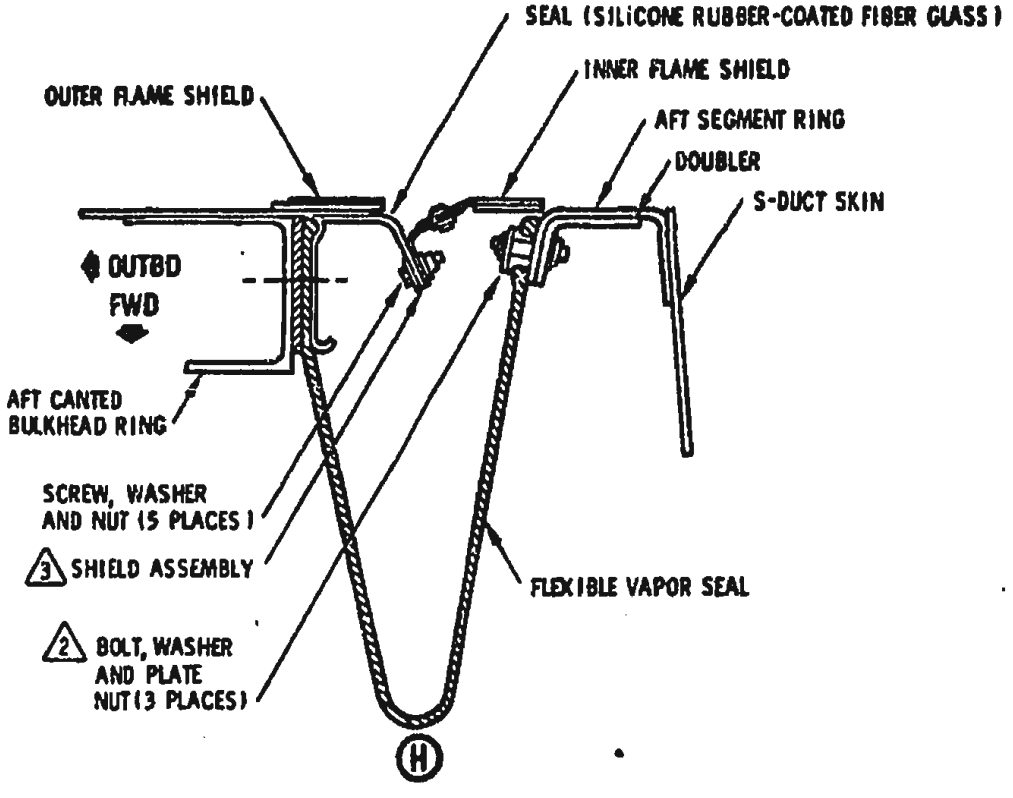
VIEW SHOWING SHIELD ASSEMBLY AND ALIGNMENT FITTING INSTALLATION (TYPICAL LEFT AND RIGHT)

NOTE

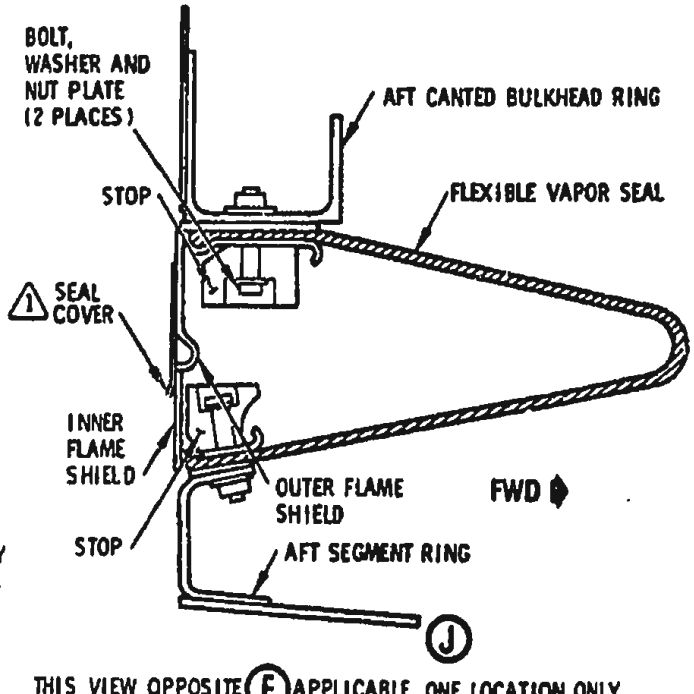
1. GAP BETWEEN INNER AND OUTER FLAME SHIELDS NOT TO EXCEED 0.060 INCH. TO OBTAIN THIS GAP REQUIREMENT, INSTALL SPACERS AS REQUIRED, BETWEEN INNER CLIP AND FLAME SHIELD. SPACERS ARE 2024-T3, 1 x 3 x 0.063 TO 0.250 INCHES THICK, WITH HOLE SIZE IN SPACER SAME AS CLIP. GAP BETWEEN SPACER AND S-DUCT SEGMENT RINGS NOT TO EXCEED 0.060 INCH
2. VIEWS (G) AND (H) SHOW SHIELD ASSEMBLY REQUIRED TO SEAL AREA ADJACENT TO ALIGNMENT FITTING (LEFT AND RIGHT SIDE)

M1-0100-54-050

Center Engine "S" Duct - Flexible Vapor Seal Installation
Figure 401 (Sheet 3)



VIEW SHOWING SHIELD ASSEMBLY INSTALLATION AND ALIGNMENT FITTING ATTACH BOLTS



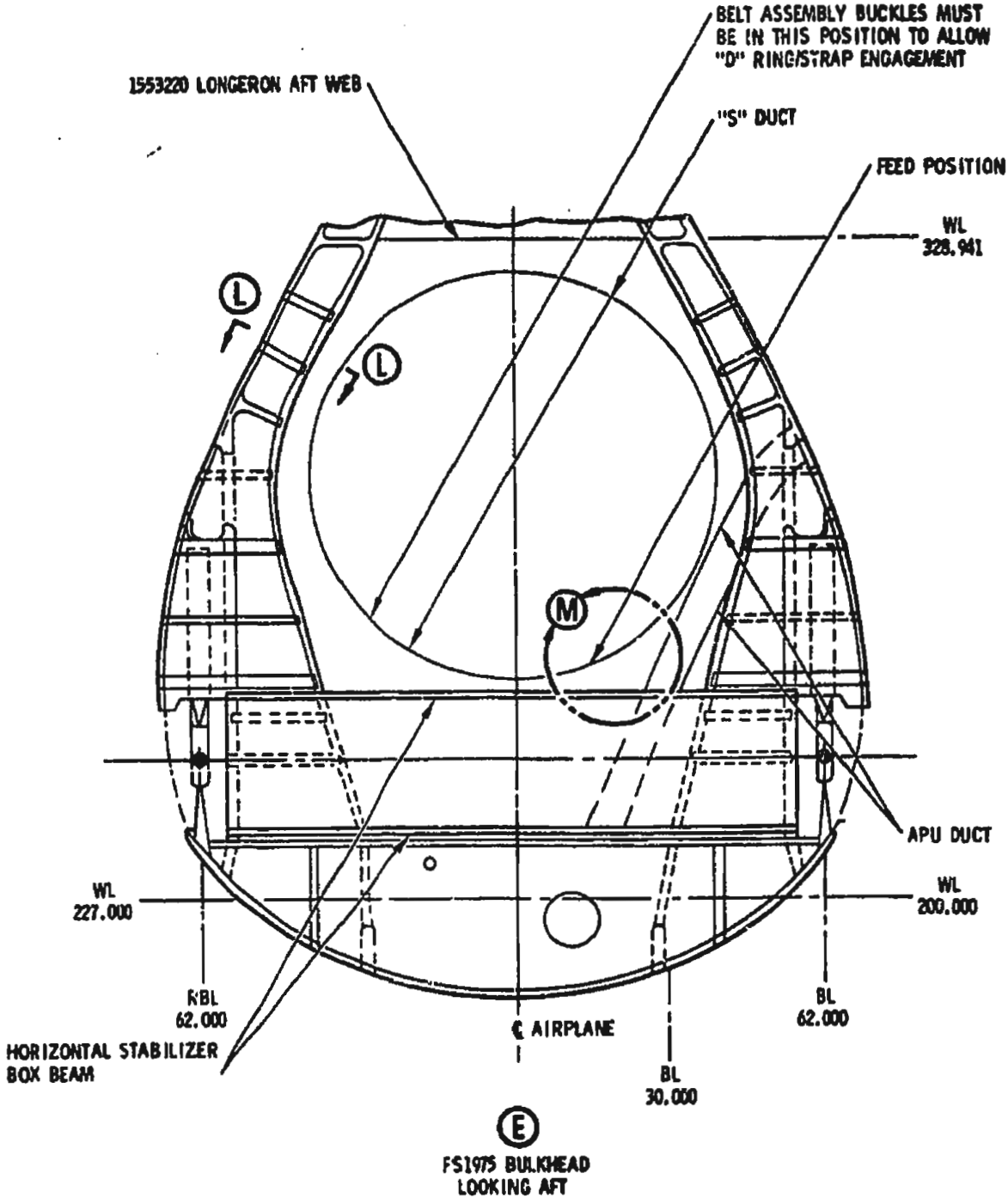
THIS VIEW OPPOSITE (E) APPLICABLE ONE LOCATION ONLY

NOTE

1. VIEWS (E) AND (J) HAVE CUTOUT OPENINGS IN FLAME SHIELDS WHICH REQUIRE SMALL SEAL COVER PLATES IN LOCALIZED AREAS
2. THESE BOLTS ATTACH ALIGNMENT FITTING (LEFT AND RIGHT) TO AFT SEGMENT RING
3. VIEWS (G) AND (H) SHOW SHIELD ASSEMBLY REQUIRED TO SEAL AREA ADJACENT TO ALIGNMENT FITTING (LEFT AND RIGHT SIDE)

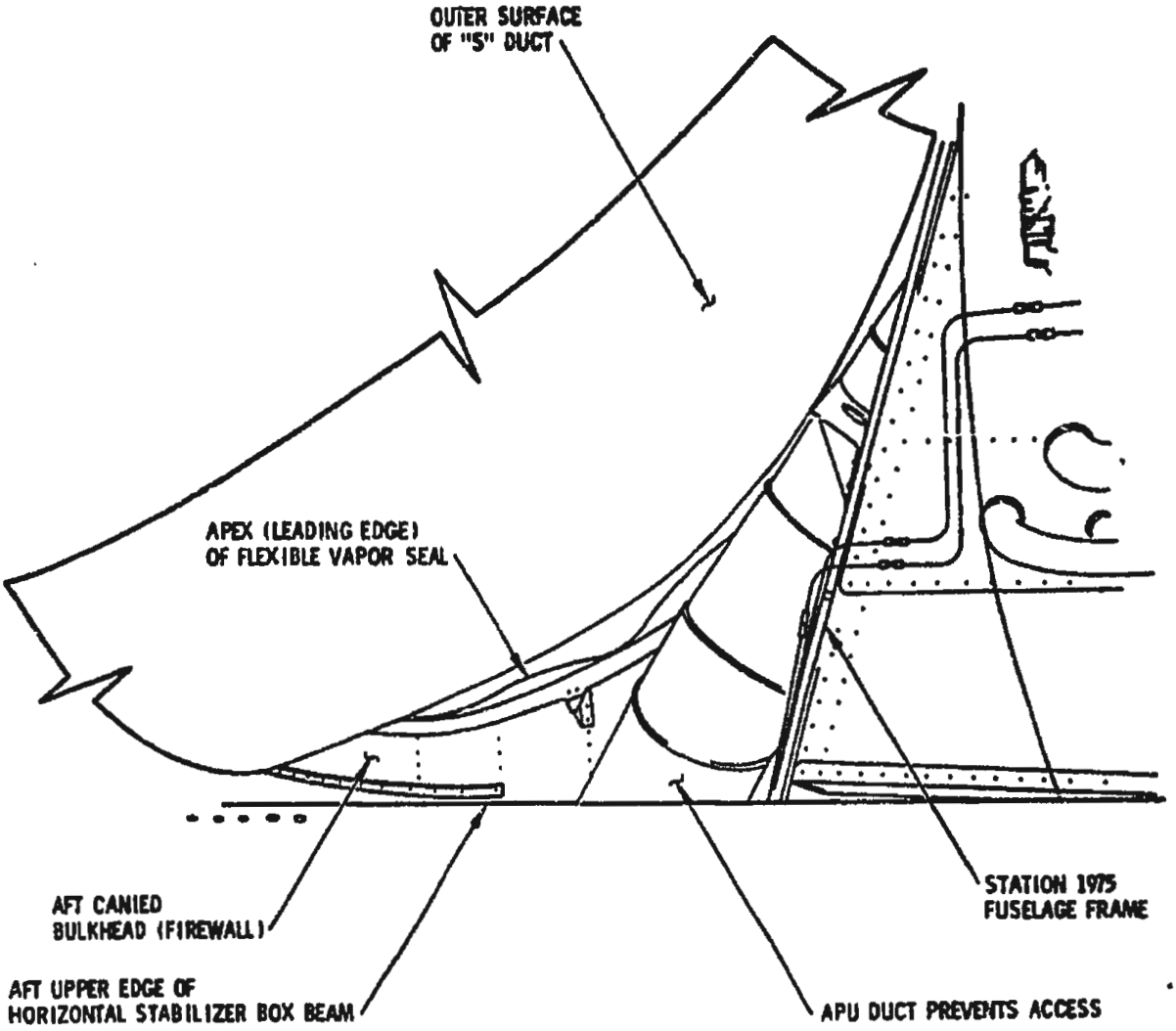
MI-0100-54-051

Center Engine "S" Duct - Flexible Vapor Seal Installation
Figure 401 (Sheet 4)



M1-0100-54-052

Center Engine "S" Duct - Flexible Vapor Seal Installation
Figure 401 (Sheet 5)

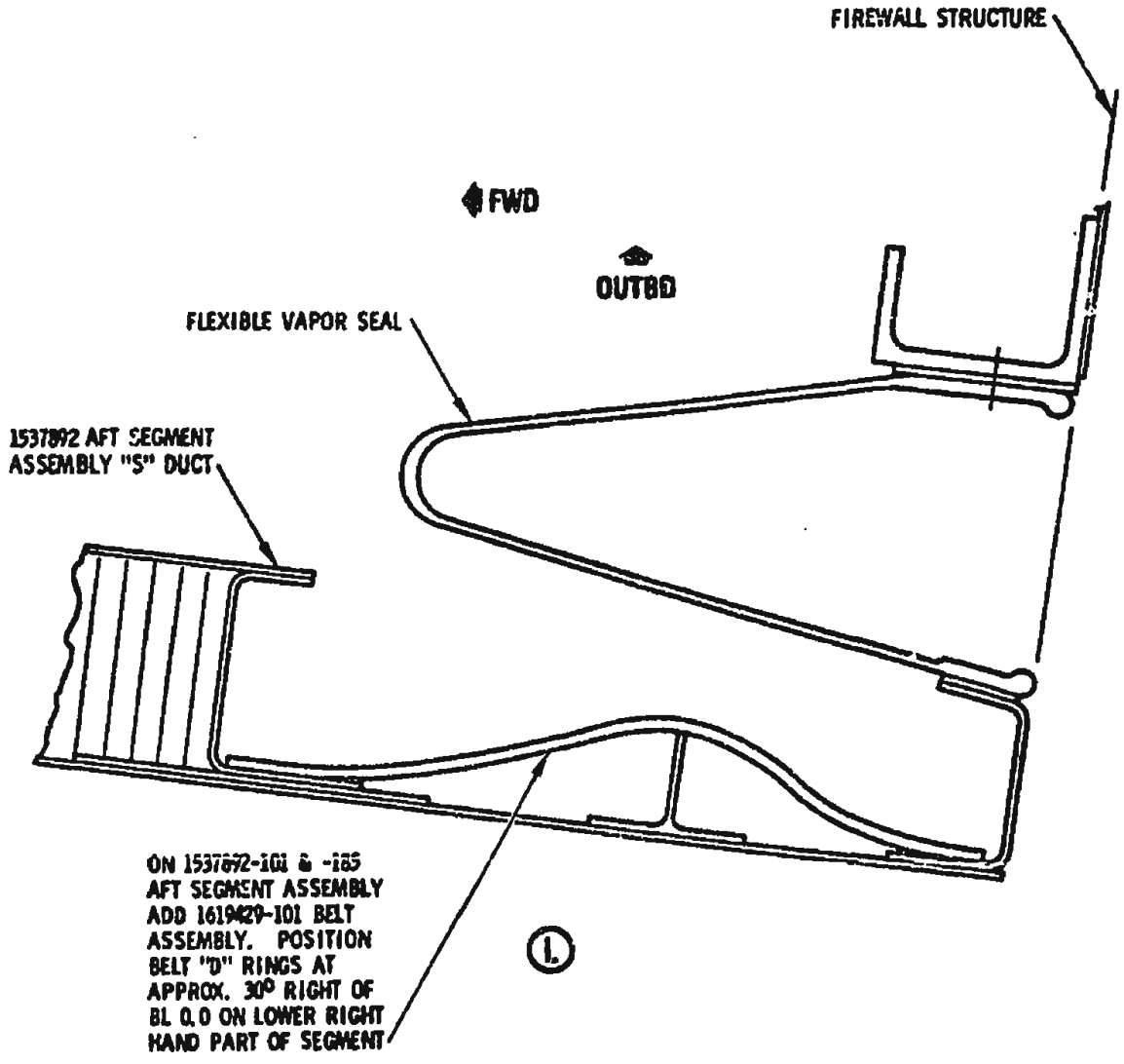


(M)

LOWER LEFT HAND SIDE LOOKING AFT

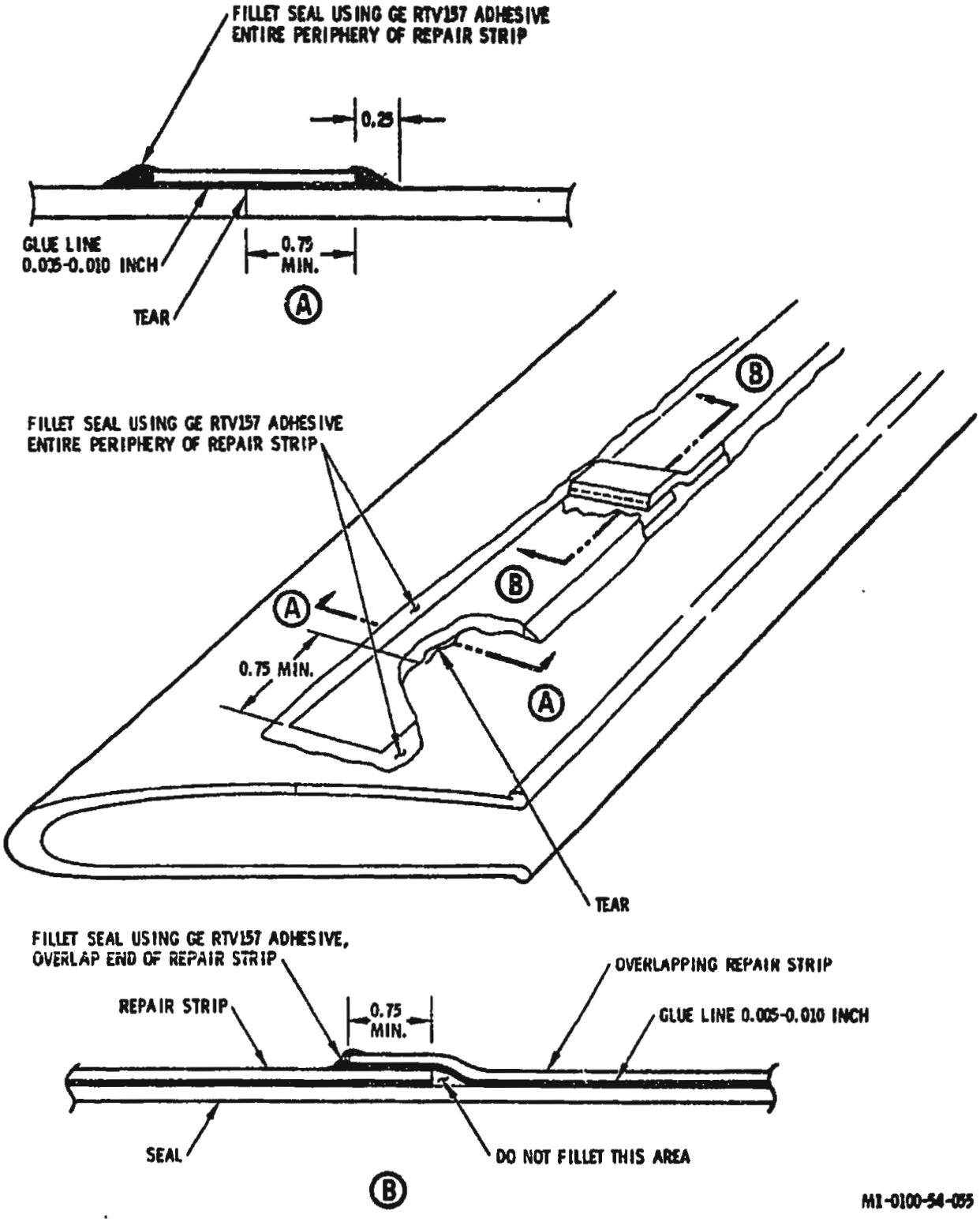
M1-0100-54-053

Center Engine "S" Duct - Flexible Vapor Seal Installation
Figure 401 (Sheet 6)

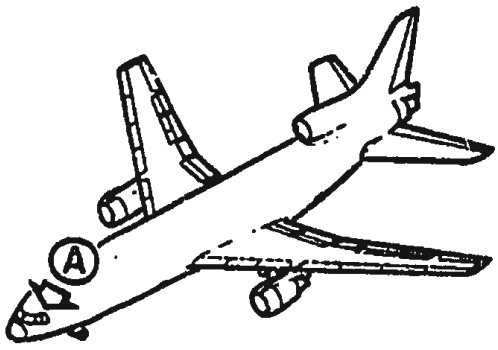

FIREWALL STRUCTURE
FWD
OUTBD
FLEXIBLE VAPOR SEAL
1537892 AFT SEGMENT ASSEMBLY "S" DUCT
ON 1537892-101 & -185 AFT SEGMENT ASSEMBLY ADD 1619429-101 BELT ASSEMBLY. POSITION BELT "D" RINGS AT APPROX. 30° RIGHT OF BL 0.0 ON LOWER RIGHT HAND PART OF SEGMENT
L

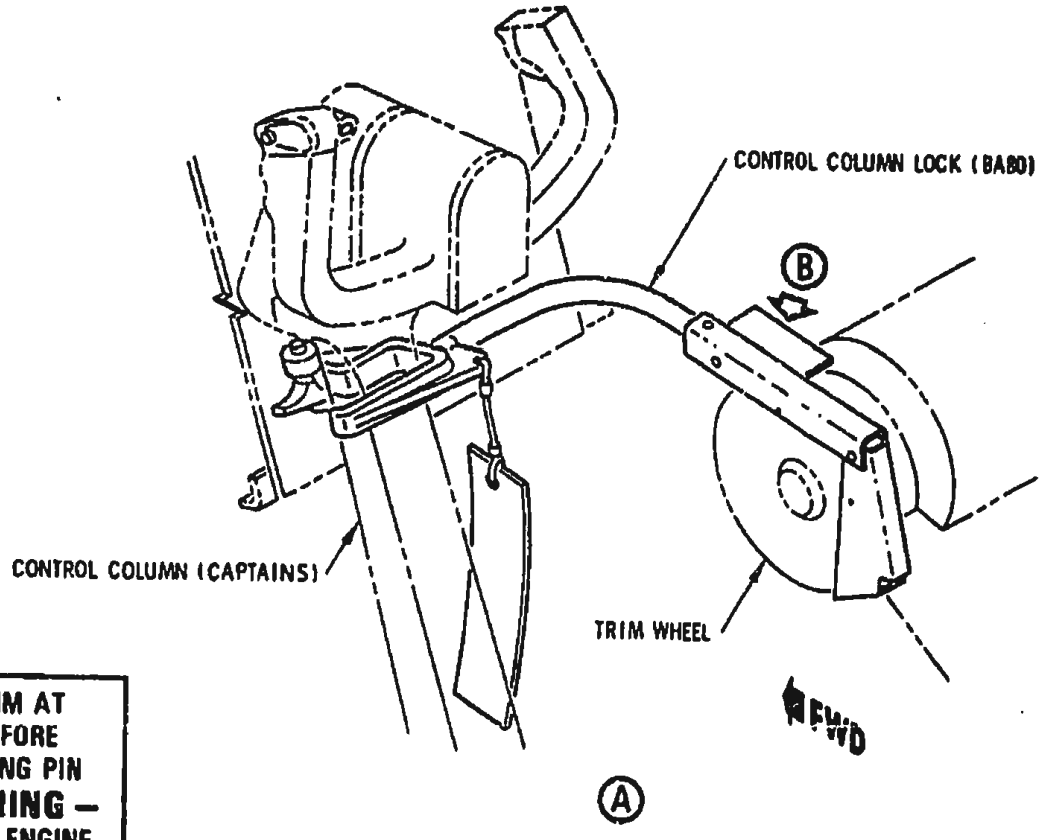
M1-0100-54-054

Center Engine "S" Duct - Flexible Vapor Seal Installation
Figure 401 (Sheet 7)



Repair of "S" Duct Flexible Vapor Seal
Figure 402





SET TRIM AT
"0" BEFORE
INSTALLING PIN
– WARNING –
CLOSE #2 ENGINE
UPPER COWL PANEL
LATCHES BEFORE
REMOVING PIN

B

M1-0000-54-099

R
R Control Column and Trim Wheel Lock
Figure 403

R
R EFFECTIVITY: ALL
001B

R FLEXIBLE VAPOR SEAL, CENTER ENGINE "S" DUCT
R INSPECTION AND CHECK

R 1. General

R Inspection of flexible vapor seal may be necessary if the
R protective belt assembly has not been installed. The belt
R assembly prevents chafing of the vapor seal against an extruded
R "T" on the aft segment assembly "S" duct (Ref. Fig. 401, Sheet
R 7).

R 2. Description and Operation

R Inspection may be accomplished without removal of the engine.
R The seal may be approached from the forward side of the
R firewall. The necessary steps to gain access are found on Page
R 801, 58.

R 3. Inspection/Check

R Visually inspect circumference of seal from forward side of
R firewall. The more accessible lower portion of the seal, from 4
R to 8 o'clock, will be used as the criterion to determine extent
R of wear. Depth of wear may be measured by using a putty or clay
R imprint. At the time chafing protection is installed (Ref. Page
R 401, 5C and 5D), depth must not exceed 0.035 inch.

FLEXIBLE VAPOR SEAL, CENTER ENGINE "S" DUCT APPROVED REPAIRS

1. General

The flexible vapor seal for the number two engine isolates the engine compartment, which is a fire zone, from the afterbody of the airplane. A torn seal can permit vapor from the engine compartment to enter the unpressurized fuselage afterbody.

Repair of the damaged seal may be accomplished without removal of the engine. The repair may be performed from either the forward or aft side of the firewall.

2. Referenced Procedures

6-30-00	Zone Diagrams - Description and Operation
6-40-00	Exterior Access Doors and Removable Panels - Description and Operation
54-26-00	Center Engine "S" Duct - Removal and Installation
71-12-01	LH and RH Lower Hinged Cowls - Servicing
71-12-05	LH and RH Lower Hinged Cowls - Removal and Installation

3. Equipment and Materials

Adhesive - RTV 157 (Type I) LCM 30-2085, 1 quart, (General Electric Co.) or equivalent

Cleaner - TCP 657 (LAC 32-337) 1 gallon, (Turco Products, Inc.) or equivalent

Fabric, Rubber - glass - C-23-1193, 10' x 2", (Kirkhill Rubber Co.)

Clay, modeling - Plasteline, 1/4 lb., (Sculpture House) or H.G.Daniels Co.)

R Belt Assembly - PN 1619429-101 (Lockheed)

Fabric - Nomex, Style, No. HT 2002, 20' x 2") Mohawk Fabric Company, Inc.)

Solvent, MEK - Federal Specification TT-M-261B, 1 gallon (Obtain locally)

Solvent, Cee Bee - EO Special Cleaner, 1 gallon, (Cee Bee Chemical Co.)

Arrow Staples - 5/8" Staples, 300 count, (Arrow Fastener Co.)

Arrow Stapler - JT-21 (Arrow Fastener Co.)

R 4. Repair of Flexible Vapor Seal in Place

A. Seal Repair From Aft Side of Firewall

R WARNING: VERIFY THAT ALL FOUR HYDRAULIC SYSTEMS ARE SHUT
R OFF (REF. 29-11-00). TAG FLIGHT ENGINEEERS
R HYDRAULIC SYSTEM PANEL, ZONE 215, HYDRAULIC
R SERVICE PANEL, ZONE 147, AND BOTH ELEVATOR CONTROL
R COLUMNS, ZONE 210, TO ASSURE NO INADVERTENT
R ELEVATOR MOVEMENT. INSTALL CONTROL COLUMN LOCK.

(1) Open the No. 2 engine upper and lower cowl doors 433AL, 434AR, 433DL and 434DR to gain access to aft face of aft canted bulkhead firewall, zone 439 (Ref. 6-40-00, 71-12-01 and 71-12-05).

R CAUTION: USE ONLY A SOFT TIPPED INK PEN AND DO NOT
R PENETRATE OR DAMAGE THE SURFACE OF THE NEW SEAL.

(2) With engine and engine air intake adapter installed in position, mark areas of vapor seal damage on aft face of firewall adjacent to the outer flame shield. Assure
R that damage does not exceed limits (Ref. 54-26-00).

(3) Remove inner and outer flame shields as necessary to expose damaged area.

NOTE: Remove enough of the flame shield from the undamaged areas (two to three feet) on each side of the repair, to allow for patch overlap and easier access. The flame shield is attached by screws.

R CAUTION: IDENTIFY ALL COMPONENTS AND THEIR LOCATIONS AS
R THEY ARE REMOVED, TO ASSURE MAINTENANCE OF
R SPECIFIED CLEARANCES UPON REASSEMBLY.

(4) Unbolt and remove inner and outer flame shield attach clips, miscellaneous hardware, and vapor seal inner and
R outer retainer ring segments (Ref. 54-26-00).

NOTE: If necessary, also remove engine air intake adapter alignment fittings, located at three and nine o'clock.

(5) Separate and unfasten section of vapor seal from "S" duct and firewall surfaces. Pull that section of the seal aft until damaged area is clear of structure. Open the "V" shaped vapor seal in the area of damage to permit installation of patches on its forward surface.

R CAUTION: REPAIRABLE TEAR LIMITED TO SIX INCHES MAXIMUM
R LENGTH.

R (6) Carefully align and secure edges of tear together by
R stapling across the tear every 0.5 inch.

(a) Using an open Arrow JT-21 Stapler, tack staples through the material from the aft side.

NOTE: The use of a back-up bar on the forward side of the seal will help in tacking. Position bar close to (but not over) the place where the points will protrude.

(b) After inserting staples through the seal, bend the legs of the staples to secure them in place.

NOTE: Use back-up bar to assure staple is firmly seated while securing staples.

(7) Cut two strips of tricot knit Nomex Style No. HT-2002 Fabric a minimum of 1.5 inches wide, and long enough to
R cover the tear. Provide minimum 0.75 inch extension
R past each end of the tear, and 0.75 inch minimum coverage from tear to edge of patch along its length.

NOTE: If sheet material is of insufficient length to
R cover tear, cut shorter pieces and provide 0.75
R inch overlap at each splice of the Nomex.

R CAUTION: ONLY USE NON-CHLORINATED SOLVENTS ON OR NEAR
R TITANIUM COMPONENTS. OTHERS WILL CAUSE HALOGENIC
R CONTAMINATION.

R CAUTION: IMMEDIATELY WIPE DRY ALL RUBBER SURFACES BEING
R CLEANED TO PREVENT SOLVENTS FROM SOAKING INTO AND
R CAUSING THE DETERIORATION OF THE RUBBER.

(8) Clean the surfaces of the repair strips, and the vapor seal area on which they will be applied, with Cee Bee EO Special Cleaner or MEK Solvent.

(9) Apply approximately 1/16 inch thick layer of adhesive to the vapor seal repair area that will be covered by the repair material.

(10) R Coat the first layer of Nomex HT-2002 fabric with adhesive approximately .025 inch thick before applying it to the adhesive on the vapor seal. Press fabric smooth with a spatula so that adhesive squeezes through pores of the fabric.

R (11) Repeat Step 4A(10) with second ply of fabric.

(12) Using a spatula, form the adhesive squeeze-out into a fillet around the edge of the repair strip. Add adhesive as necessary to completely seal the edge.

(13) Completely coat the complete Nomex HT-2002 two-layered fabric patch with approximately 1/16 inch of adhesive, fairing all edges in the process and smoothing surface with a spatula.

(14) Allow repair to cure a minimum of 16 hours at a minimum temperature of 70° F, before disturbing the seal.

(15) After repair cures, relocate the seal in its original position.

R R R CAUTION: RELOCATE ALL COMPONENTS AT THEIR ORIGINAL LOCATIONS TO ASSURE MAINTENANCE OF SPECIFIED CLEARANCES.

(16) Reinstall each part removed.

(a) Replace vapor seal inner and outer retainer ring segments, attach clips, and miscellaneous hardware. Tighten bolts to a torque of 25 to 30 pound inches.

NOTE: If engine air intake adapter alignment fittings were removed from the three and nine o'clock positions during disassembly, reinstall in position.

(b) Replace inner and outer flame shields.

(c) Close the No. 2 engine upper and lower cowl doors 433AL, 434AR, 433DL, and 434DR.

B. Accomplishment of Seal Repair from Forward Side of Firewall.

R CAUTION: VERIFY THAT ALL FOUR HYDRAULIC SYSTEMS ARE SHUT
R OFF (REF. 29-11-00). TAG FLIGHT ENGINEERS
R HYDRAULIC SYSTEM PANEL, ZONE 215, HDYRAULIC
R SERVICE PANEL, ZONE 147, AND BOTH ELEVATOR CONTROL
R COLUMNS, ZONE 210, TO ASSURE NO INADVERTENT
R ELEVATOR MOVEMENT. INSTALL CONTROL COLUMN LOCK.

NOTE: Repair of damage to the vapor seal from the forward side can be accomplished only on the lower sector of the seal between its 5 o'clock and 8 o'clock positions (looking aft) due to very limited access to the seal. The services of a lean individual, small of stature, who can squeeze down into the restricted
R area between firewall and the aft beam of the stabilizer center section, should be utilized to accomplish the task. Repair of tears in the vapor seal greater than three inches in length, that require holding the torn edges together in alignment while the patch is being applied, cannot be accomplished from the forward side as there is insufficient space to install holding staples across the tear.

(1) Gain access through Access Door 317BB (Ref. 6-30-00, 6-40-00).

R (2) Accomplish repair in accordance with Steps 5A(7) through 5A(14).

(3) On completion of repair, close and secure Access Door 317BB (Ref. 6-30-00, 6-40-00).

CENTER ENGINE COWLING STRUCTURE - DESCRIPTION AND OPERATION

1. General

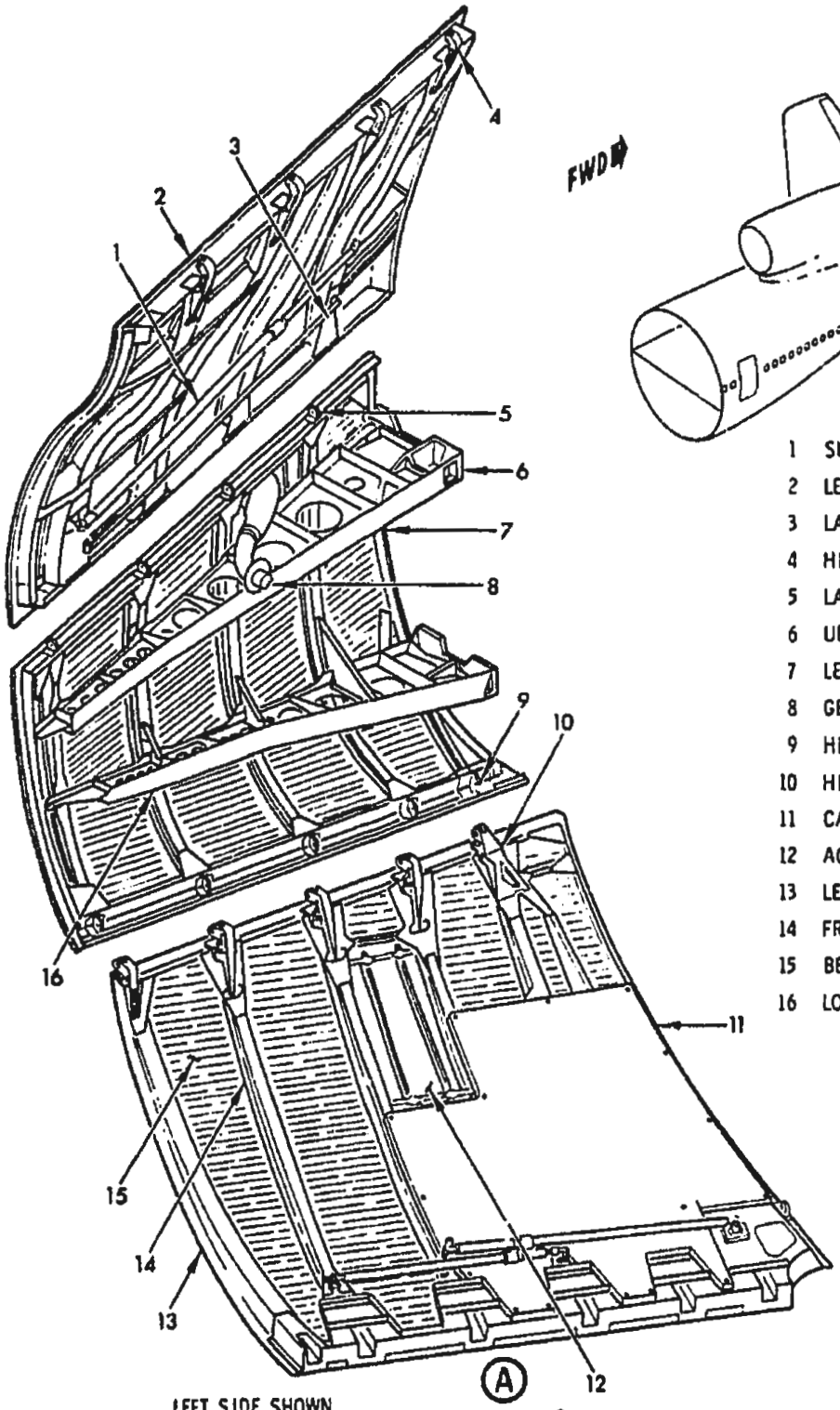
Six removable cowl panels (Ref. Fig. 1) provide access to the No. 2 engine (center engine). The cowl panels provide a smooth aerodynamic fairing between the fuselage afterbody aft lower section and the engine thrust reverser. The upper and lower cowl panels on the left and right sides of the engine are hinged with quick-opening latches.

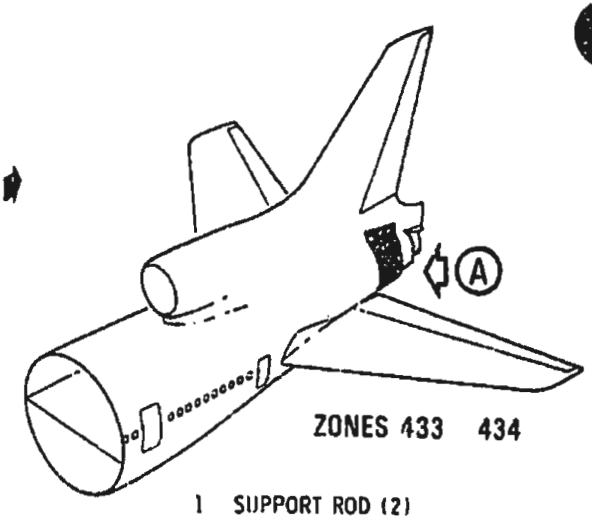
The center cowl panels on both sides are fixed to provide support between the aircraft afterbody and the engine firewall and thrust reverser diaphragm. The fixed center cowls also provide support to the hinged cowling. The fixed cowl panels are removable to accommodate replacement of the engine installation.

The upper hinged cowl panel structure consists of titanium longerons and frame assemblies of aluminum and titanium. Each upper cowl panel is supported by four hinge assemblies. Cowl support rods are used to hold the doors open.

The mid fixed cowl panel structure consists of upper and lower longerons, vertical frame assemblies, and two beam assemblies machined from forgings. The mid cowl structure is made principally of aluminum.

The lower hinged cowl panel structure consists of aluminum longerons, frames, intercostals, and stiffeners. Each lower cowl panel is supported by five hinge assemblies. Two cowl support rods may be used to hold each panel open.





1 SUPPORT ROD (2)
2 LEFT UPPER HINGED COWL
3 LATCH ASSEMBLY (TYP)
4 HINGE ASSEMBLY (4)
5 LATCH LUG (4)
6 UPPER BEAM
7 LEFT MID FIXED COWL
8 GEARBOX BREATHER DUCT
9 HINGE FITTING (5)
10 HINGE ASSEMBLY (5)
11 CATWALK
12 ACCESS DOOR (LEFT COWL ONLY)
13 LEFT LOWER HINGED COWL
14 FRAME (TYP)
15 BEADED SHEET ALUMINUM SKIN (TYP)
16 LOWER BEAM

HH 5154
M1-A00-54-008

Center Engine Cowl Panels
Figure 1

PLATES/SKINS - DESCRIPTION AND OPERATION

1. General

The pylon skins vary in material type and thickness. The wing pylon leading edge consists of three removable panels. The forward and aft panels are made of 7075-T6 aluminum sheet. The center panel has a frame of titanium with two aluminum blow-out panels riveted to the outer surface.

The main frame skins consist of two panels on each side. The forward panels are made from 0.090 titanium sheet, chem-milled to various thicknesses. The aft panels are made from 0.375-inch chem-milled titanium plate.

The trailing edge skin cover and access door panel is made of honeycomb core fiberglass.

The access door is located on the forward upper right side of the trailing edge.

The two engine mount access doors are made of 2024-T3 clad aluminum alloy, and have silicone rubber sponge gaskets.

The center engine support structure skins forward of FS 2068 are made of aluminum alloy. The skins aft of FS 2068 are made of titanium alloy.

Flush access doors are located along the sides of the structure. There are five doors on the left side, and three doors on the right side.

All center engine cowl panels are made of aluminum alloy. The panels consist of a smooth outer skin, a reinforcing doubler, and a beaded inner skin.

NOSE COWL SKINS (ENGINES NO. 1 AND 3) DESCRIPTION AND OPERATION

1. General

The nose cowl skins are secured together around the front and rear bulkhead structures with rivets.

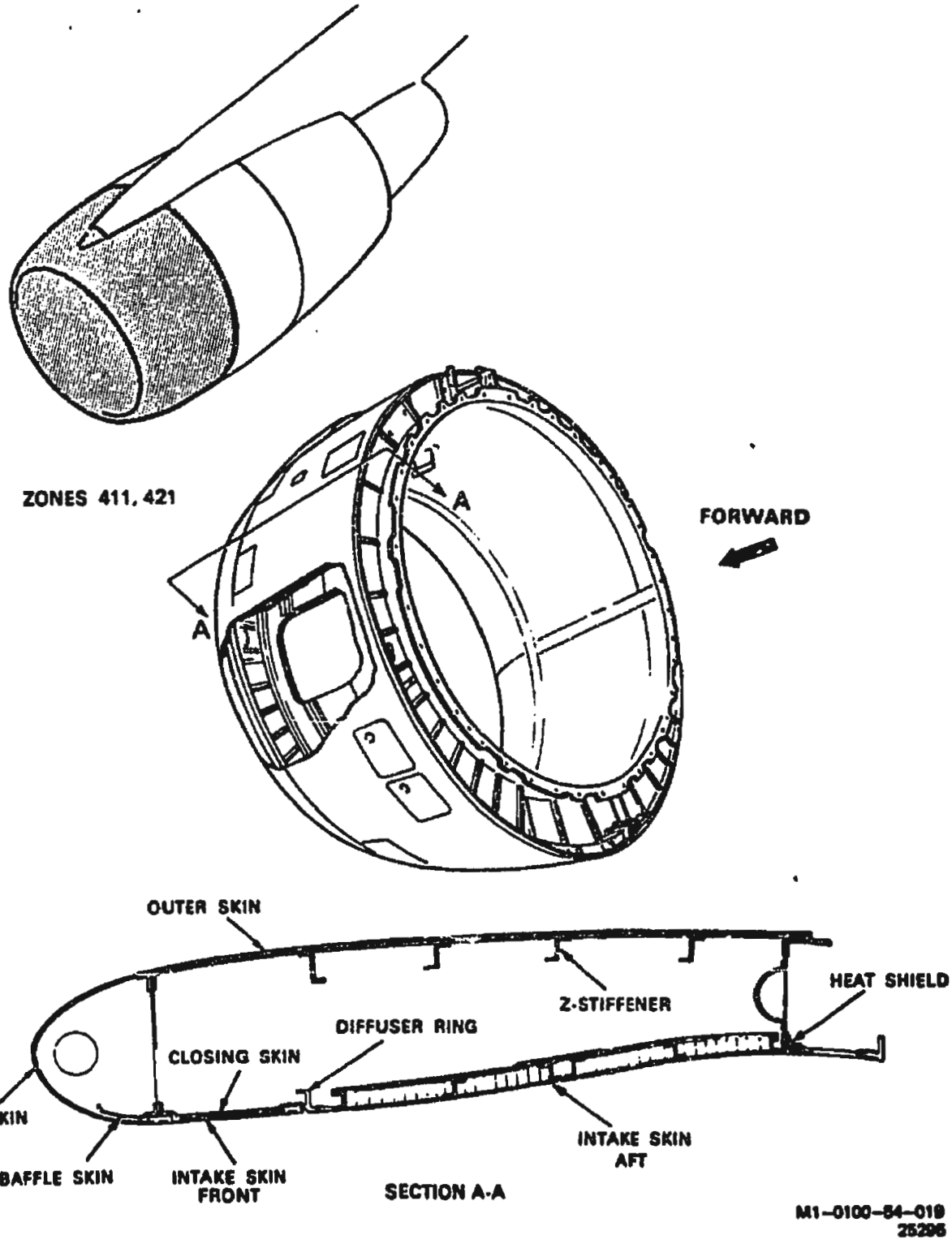
The skins (Ref. Fig. 1) are made of aluminum alloy, electro-chemical machined to various thicknesses. The skin sections are made up of segments and are assembled together with butt straps and rivets.

The lip skin is of six segments and forms the front of the nose cowl. The front intake skin is secured to the lip skin and terminates in the diffuser ring. Two skins the baffle skin and the closing skin, form an annulus internally between the lip and front intake skin and the diffuser ring.

The aft intake skin comprises four segments of noise attenuation material. Each segment comprises a perforated inner skin and an outer skin bonded to a core of aluminum honeycomb and strengthened by Z-stiffeners. Drain channels are incorporated in the assembly. The rear section of the inner skin has an extra skin of titanium at the fillet to the rear bulkhead.

The outer skin is of four segments and is strengthened by Z-section hoop stiffeners.

Twelve flush fitting access doors (Ref. 6-40-00) and the inlet and outlet of two systems (Ref. 71-00-00) are provided in the nose cowl outer skin.



Nose Cowl Skins (Engines No. 1 and 3)
Figure 1

HINGED COWL SKIN (ENGINES NO. 1 AND 3) DESCRIPTION AND OPERATION

1. General

The left-hand (L.H.) and right-hand (R.H.) hinged cowls are
R semi-circular in shape and consist of an inner and outer skin of
R aluminum alloy electro-chemical machined to various thicknesses and bonded to a core of aluminum honeycomb.

R Both hinged cowls have a heat shield of titanium sheet, approximately 10.0 in. deep, attached to the upper section of the inner skin to protect the ccaming and hinge attachment areas.

R Hinged or removable doors and panels of aluminum alloy, and the inlets and outlets of some engine systems are included in both cowls. The L.H. cowl carries four doors, one panel and two vents, and the R.H. cowl carries two doors, an outlet duct and a vent.

Inserts within the honeycomb provide the attachment feature for the hinge arms. Stiffened sections and members provide for the attachment of the cowl main and safety latches.

COLD STREAM REVERSER TRANSLATING COWL SKIN DESCRIPTION AND OPERATION

1. General

The cold stream reverser translating cowl inner and outer skins are made of aluminum alloy electro-chemical machined to various thicknesses.

Each skin comprises three segments secured together by butt straps and rivets.

The skins are secured at the forward end, by rivets, to a circumferential diaphragm and a jury ring and at the rear they are joined together by rivets. Three additional diaphragms support and space the center section.

The forward section of the outer skin is formed by three detachable panels that provide access to the cold stream reverser mechanical drive housings and finger brackets.

Part of the outer skin is formed by two interface translating fairings, for information on these fairings, see 54-53-00.

COLD STREAM COLLECTOR AND NOZZLE SKIN DESCRIPTION AND OPERATION

1. General

The cold stream nozzle inner and outer skins are made of aluminum alloy electro-chemical machined to various thicknesses.

Each skin comprises three segments secured together by butt straps and rivets.

Both skins are separated by and rivetted to circumferential stiffeners. The rear edge of both skins are rivetted together to form the nozzle exit.

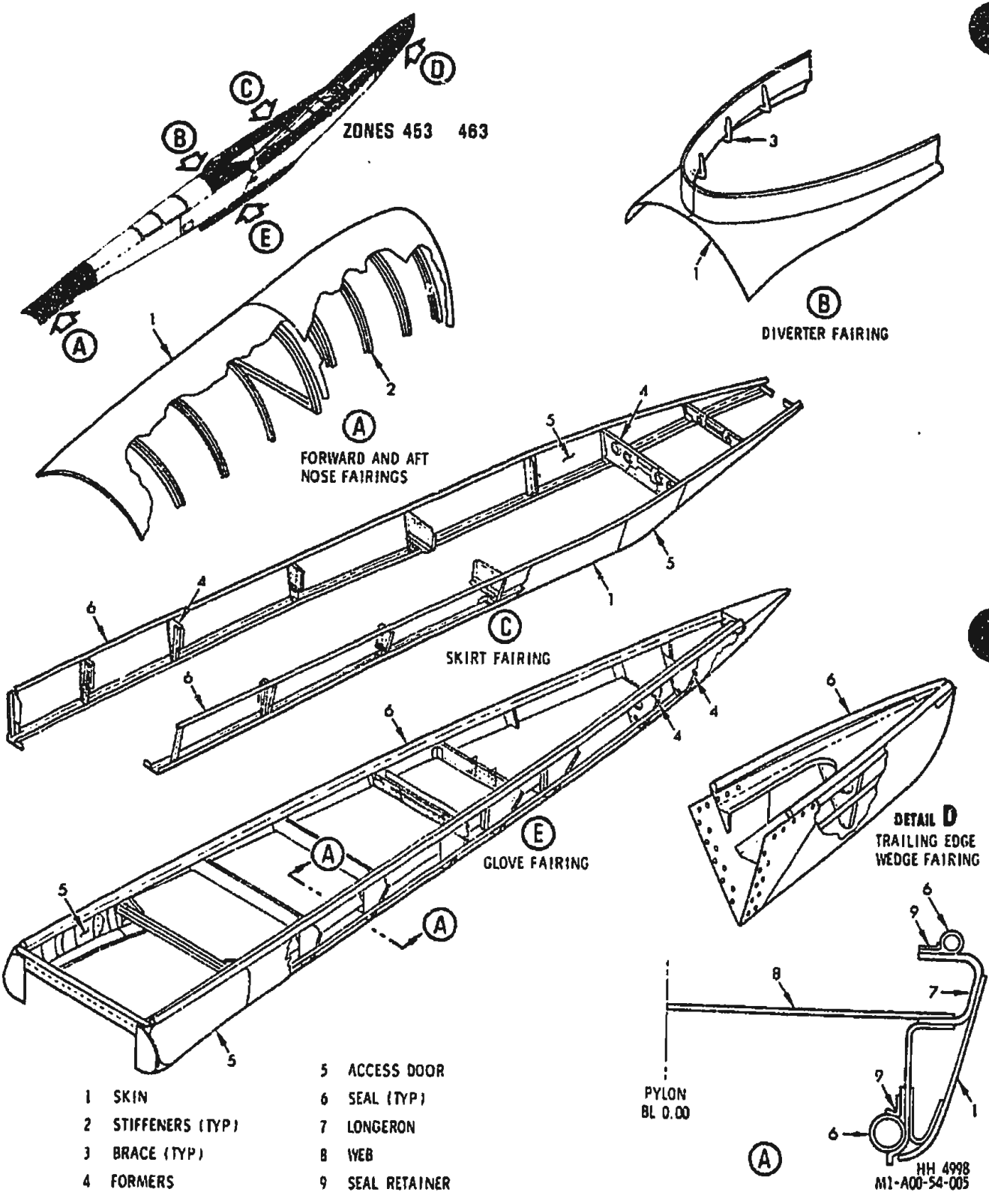
Noise attenuating panels are bonded to the bore of the inner skin over approximately half the nozzle length.

Two small panels incorporated in the outer skin of the nozzle extension and seal assembly, provide access to the thrust reverser slinging points.

WING PYLON FAIRINGS - DESCRIPTION AND OPERATION

1. General

The pylon fairings (Ref. Fig. 1) consist of the forward and aft nose panels, diverter fairing, skirt fairings, glove fairing, and trailing edge wedge. The forward nose panel is made of chem-milled aluminum alloy skins with aluminum stiffeners. The aft nose panel is made of chem-milled titanium skin and is reinforced with aluminum stiffeners. The diverter fairing is made of 6061-T6 aluminum alloy. The diverter fairing located at PS 220.70, interfaces the lower surface of the wing. The skirt fairings are made of aluminum formers and stringers that have compressed aluminum honeycomb core (Bondolite) panel covers. Full-length bulb seals of silicone rubber are attached along its upper edge. The glove fairing, located on the lower side of the pylon, is made of 7075-T6 aluminum alloy structure consisting of formers and stringers. The glove fairing is covered with fiber glass pre-preg sheet material. The tailing edge wedge is made of fiber glass with reinforcing ribs. A bulb section seal made of Dacron-covered silicone rubber is attached along its upper edges.



Pylon Fairings
Figure 1

R # DIVERTER FAIRING - REMOVAL AND INSTALLATION

R 1. General

R This procedure applies to the pylon diverter fairings for the
R left and right wing pylon locations.

R 2. Referenced Procedures

R 20-51-03 Anti-chafing Protection of Structure Contacting
R External Doors and Fillets

R 3. Removal/Installation

R A. Removal

R (1) Remove inboard section of diverter fairing by removing
R five bolts; four along lower and forward edges, and one
R at vertical attachment (Ref. Fig. 401).

R (2) Remove outboard section of diverter fairing by removing
R seven bolts along lower and forward edges.

R (3) Remove and stow sections as required.

R B. Installation

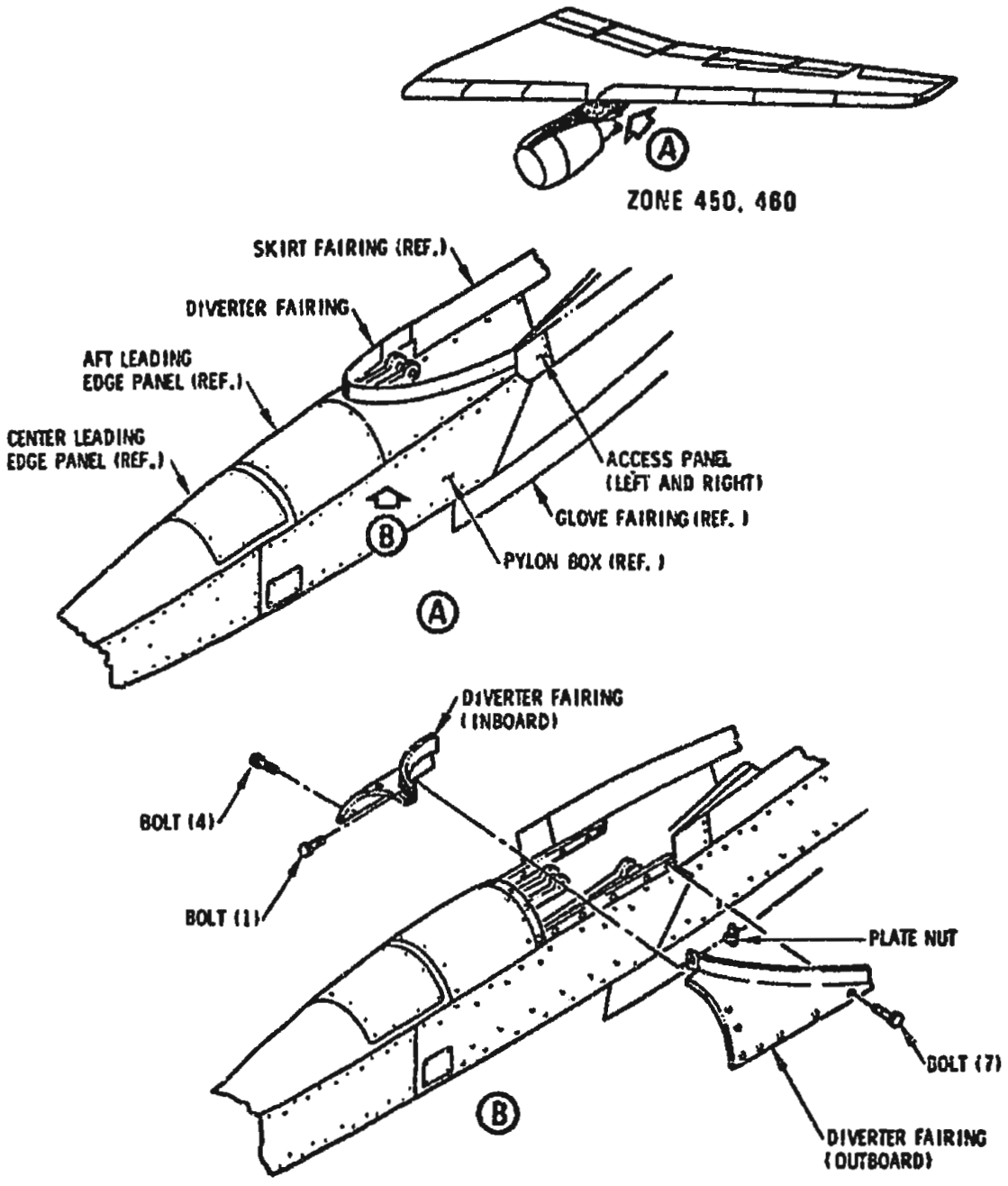
R NOTE: At the aft end of each diverter section, check
R condition of surfaces which has a coating of
R anti-chafing compound. The affected areas are
R those which interface with the pylon mount bolt
R access panels, 452FL and 452FR, or 462FL and
R 462FR as applicable. If repair is required,
R refer to 20-51-03.

R (1) Place outboard section of diverter fairing in position
R and install seven bolts along lower and forward edges
R (Ref. Fig. 401).

R (2) Place inboard section of diverter fairing in position,
R overlapping the outboard section at midpoint.

R (3) Install four bolts along lower and forward edges.

R (4) Install one bolt at vertical overlap location.



M1-0100-54-036

R Pylon Diverter Fairing - Removal and Installation
R Figure 401

R EFFECTIVITY: ALL
R
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WING PYLON GLOVE FAIRING - REMOVAL AND INSTALLATION

1. General

This procedure provides information for the removal and installation of glove fairings located on the left and right wing engine pylons, in zones 450 and 460. The procedure is the same for both pylons.

2. Equipment and Materials

Low Range Milliohmmeter, Shallcross No. 670A, or equivalent

R Installation Tool, Wing Engine Glove Fairing, PN BG08-101, or
R equivalent

3. Removal/Installation

A. Removal

(1) Remove tri-wing screws and remove glove fairing access doors as required (Ref. Fig. 401). Access door numbers are as follows:

Left pylon - 453AL and 453AR

Right pylon - 463AL and 463AR

(2) Remove quick-release pin, connecting drag link to engine nacelle fitting at PPS (powerplant station) 209.00.

(3) Remove electrical bonding jumper attachment bolts from engine nacelle fitting at PPS 204.00 (approx.).

(4) Remove glove fairing assembly by sliding unit straight aft.

NOTE: If glove fairing does not readily move aft, apply simultaneous pressure (in aft direction) on inboard and outboard side of glove fairing at access door opening.

B. Installation

(1) Check forward and aft glove fairing hangers for proper installation and alignment as follows:

(a) Tapered ends of glove fairing hangers should be aligned in forward direction.

(b) Glove fairing hanger bolt should be tightened to 110 to 125 lb in.

(c) Threaded end of bolt must not protrude through hanger. If end of hanger bolt protrudes through hanger, correct by adding AN 960-516 washers as required, between MS20002C5 washer and spring (Ref. Fig. 401). Tighten bolt to specified torque.

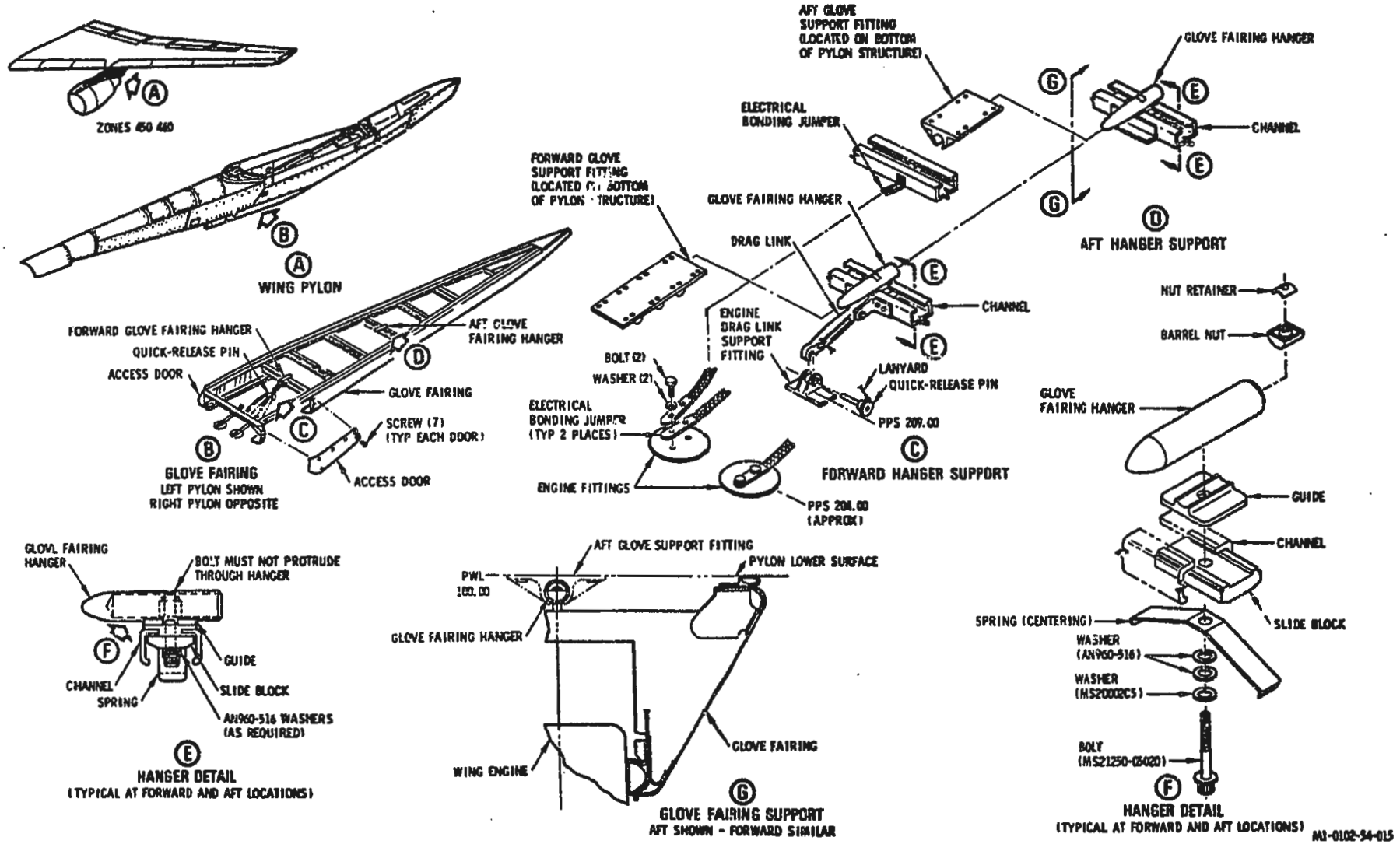
(2) Move glove fairing forward into position below pylon, while forward and aft glove fairing hangers are aligned to mate with forward and aft glove support fittings.

(3) Align glove fairing drag link with nacelle drag link fitting at PPS (powerplant station) 209.00, and install quick-release pin.

(4) Clean bonding jumper terminal and engine fitting interface surface at PPS 204.00 (approx.), and attach bonding jumper terminal with bolts and washers.

(5) Check for bonding joint resistance of 0.01 ohm dc maximum.

(6) Install glove fairing access doors.



R R Wing Pylon Glove Fairing - Removal and Installation
Figure 401

EFFECTIVITY: ALL

0018

SKIRT FAIRING - REMOVAL AND INSTALLATION

1. General

This procedure is applicable for the wing pylon skirt fairing for the left and right pylons.

2. Referenced Procedures

6-40-00	Exterior Access Doors and Panels, Zone 400, Power Plant and Pylon
54-51-54	Wing Pylon Glove Fairing - Removal and Installation
54-51-56	Trailing Edge Wedge Fairing - Removal and Installation
54-24-01	Wing Pylon Trailing Edge Assembly - Removal and Installation

3. Removal/Installation

R A. Removal

NOTE: The various attachment bolts for the skirt fairing are not of uniform size and length. Therefore, identify all removed bolts, screws, etc. to assure reinstallation at the proper location. When bolts and screws have been reinstalled, verify that threads protrude through nut a proper distance.

(1) Remove wing pylon glove fairing (Ref. 54-51-54).

(2) Remove trailing edge wedge fairing (Ref. 54-51-56.

(3) Remove wing pylon trailing edge assembly (Ref. 54-24-01).

(4) Remove access panels 452 FL and 452 FR or 462 FL and 462 FR as applicable, located at forward end of fairing assembly (Ref. Fig. 401 and 6-40-00).

(5) Remove outboard half of fairing assembly by removing two bolts located at PS 262, 283, 306 and 330.

NOTE: It is suggested that one bolt, at outboard PS 262 and at inboard PS 247, be loosely installed to support each half fairing assembly while the

remainder of the attachment bolts and screws are being removed.

(6) Remove ten screws at former splice angles located at PS 366.

(7) Remove eight screws at former splice angles located at PS 381.

(8) While supporting outboard fairing assembly, remove two screws at aft support fitting, PS 392; and the loosely installed bolt at forward end of fairing, PS 262.

(9) Remove and stow outboard half of fairing assembly.

(10) Remove inboard half of fairing assembly by removing two bolts located at PS 247, 263, 283, 306 and 330. Leave one bolt loosely installed at PS 247 as support for fairing assembly.

(11) While supporting inboard fairing assembly, remove two screws at aft support fitting, PS 392; and the loosely installed bolt at PS 247.

(12) Remove and stow inboard half of fairing assembly.

R B. Installation

NOTE: To prevent the possibility of misalignment of attachment holes, it is suggested that all attachment bolts and screws for each half of fairing assembly be loosely installed until all are in place. Then, proceed to tighten all fasteners; making adjustments as required.

(1) Check condition of all fairing seals, including those on access doors 452 FL and 452 FR, or 462 FL and 462 FR as applicable. Replace seals as required. If seal replacement is required, proceed as follows:

(a) On inboard and outboard halves of fairing, install fabric covered silicone rubber seal in seal retainer. Trim off excess length. No other mechanical fasteners are required. (Ref. Fig. 401).

(b) For access door seals, replace seal by removing rivets and retainer.

(c) Install new silicone rubber seal of same length (Ref. Fig. 401).

R NOTE: Rivets are flush on both sides.

R Install access panel to determine whether
R seal interference exists. Trim excess as
R required.

R (2) Place outboard half of fairing assembly in position and
R install two bolts at PS 262, 283, 306 and 330.

R (3) Install two screws at aft support fitting, PS 392.

R (4) Place inboard half of fairing assembly in position and
R install two bolts at PS 247, 263, 283, 306 and 330.

R (5) Install ten screws at former splice angles located at
R PS 366.

R (6) Install eight screws at former splice angles located at
R PS 381.

R (7) Install two screws at aft support fitting.

R (8) Verify that all bolts and screws are properly tightened
R and that threads protrude through nut a proper
R distance.

R (9) Install access panels 452 FL and 452 FR or 462 FL and
R 462 FR as applicable, located at forward end of fairing
R assembly (Ref. Fig. 401 and 6-40-00).

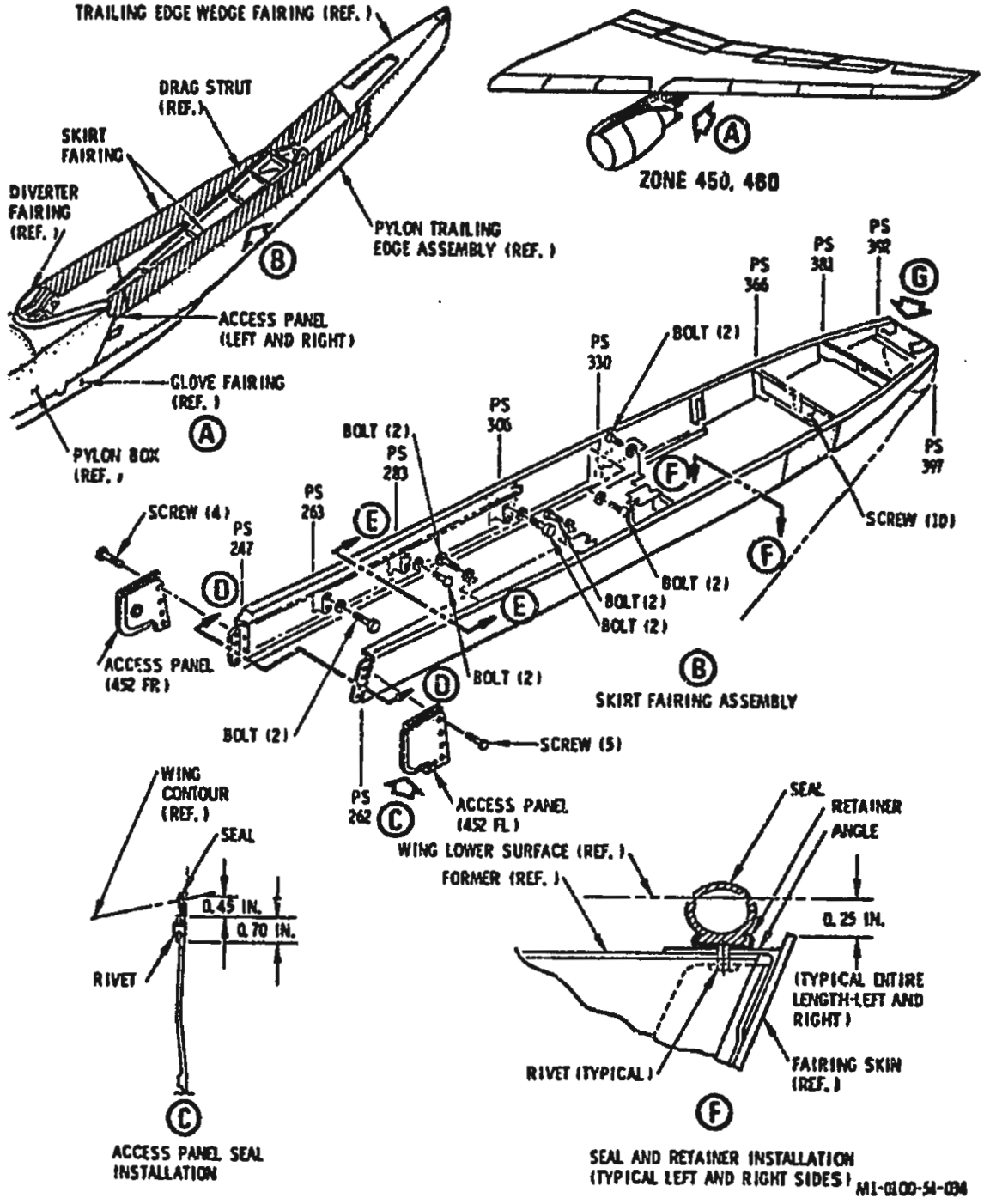
R NOTE: If new seals have been installed on access
R panels, check for proper seal contact. Trim
R length as required to eliminate any
R interference.

R (10) Verify that fairing seals are in firm contact with
R mating surfaces over the entire length.

R (11) Install wing pylon trailing edge assembly (Ref.
R 54-24-01).

R (12) Install trailing edge wedge fairing (Ref. 54-51-56).

R (13) Install wing pylon glove fairing (Ref. 54-51-54).



R Wing Pylon Skirt Fairing - Removal and Installation
R Figure 401 (Sheet 1)

R EFFECTIVITY: ALL

R
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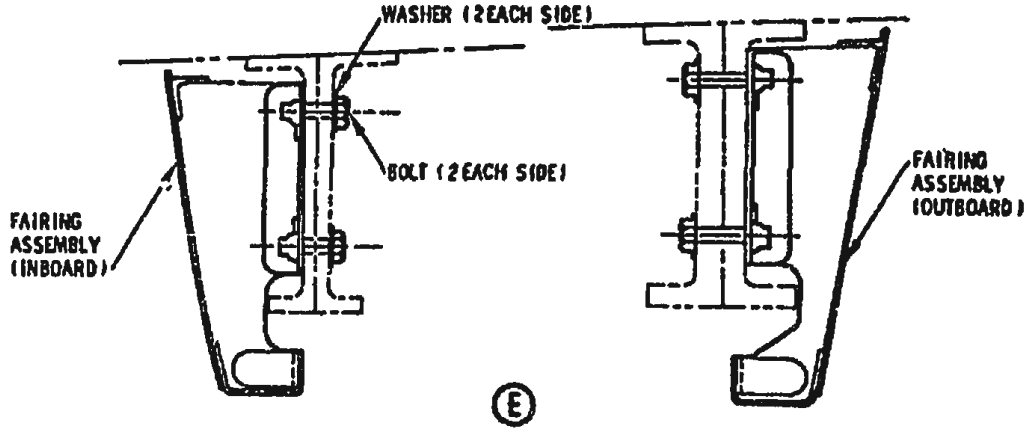
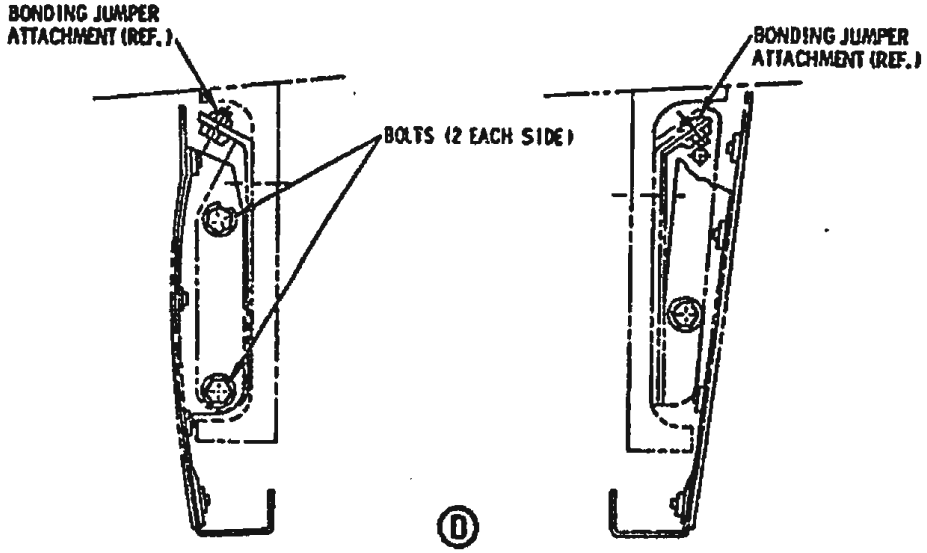
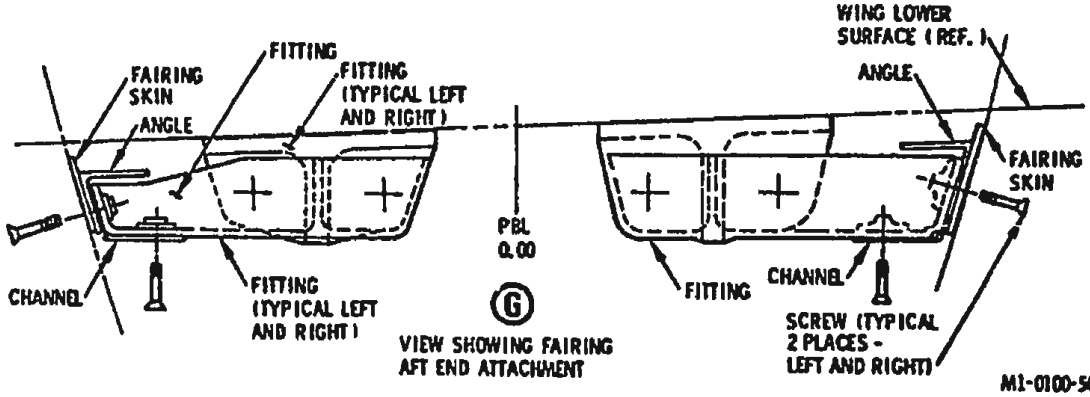


(E) VIEW SHOWING FAIRING ATTACHMENT (TYPICAL FOR PS283, 306, 330 AND INBOARD SIDE PS263; EXCEPT FOR BOLT LENGTHS)



(D) VIEW SHOWING FAIRING FORWARD END ATTACHMENT



(G) VIEW SHOWING FAIRING AFT END ATTACHMENT

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R Wing Pylon Skirt Fairing - Removal and Installation
R Figure 401 (Sheet 2)

R EFFECTIVITY: ALL

R TRAILING EDGE WEDGE FAIRING - REMOVAL AND INSTALLATION

R 1. General

R This procedure is applicable to the left and right pylon
R trailing edge wedge fairing.

R 2. Removal/Installation

R A. Removal

R (1) Remove 14 attachment bolts on inboard side of wedge
R fairing (Ref. Fig. 401).

R (2) Remove 14 attachment bolts on outboard side of wedge
R fairing.

R NOTE: The wedge fairing assembly must be supported
R during removal of the last few bolts.

R (3) Remove wedge fairing by pulling down and aft.

R (4) Stow as required.

R B. Installation

R NOTE: The wedge fairing assembly attachment holes have
R washers which are bonded to the fiber glass shell.
R Before beginning the installation of wedge fairing,
R verify that washers are present, and again as
R individual bolts are installed. The same is true for
R the seal attachment screws.

R (1) Check condition of seals. If replacement of seal(s) is
R required, proceed as follows:

R (a) Remove seal and seal retainer by removing 9 screws
R and nuts for each seal (Ref. Fig. 401).

R (b) Clean seal area and retainer as required.

R (c) Cut replacement seal to same length of removed
R seal.

R (d) Determine hole pattern and cut holes in
R replacement seal.

R (e) Place seal and retainer in position and loosely
R install screws and nuts.

R (f) Adjust seal as required and tighten screws.

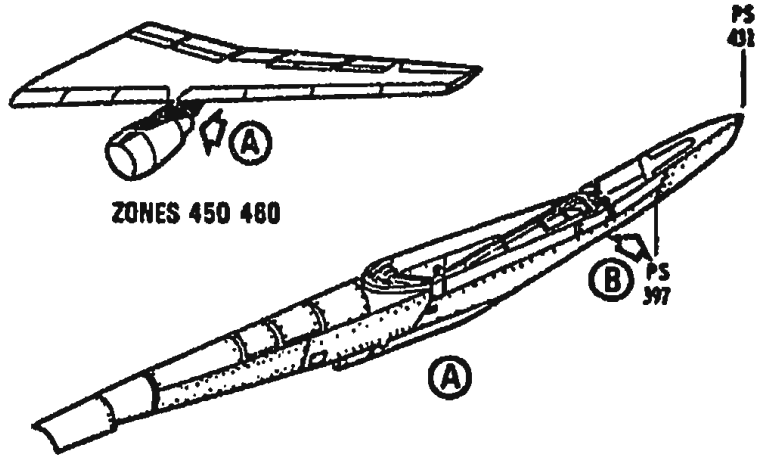
R NOTE: With wedge fairing installed, the seal must be
R in contact with the wing skin its entire length.

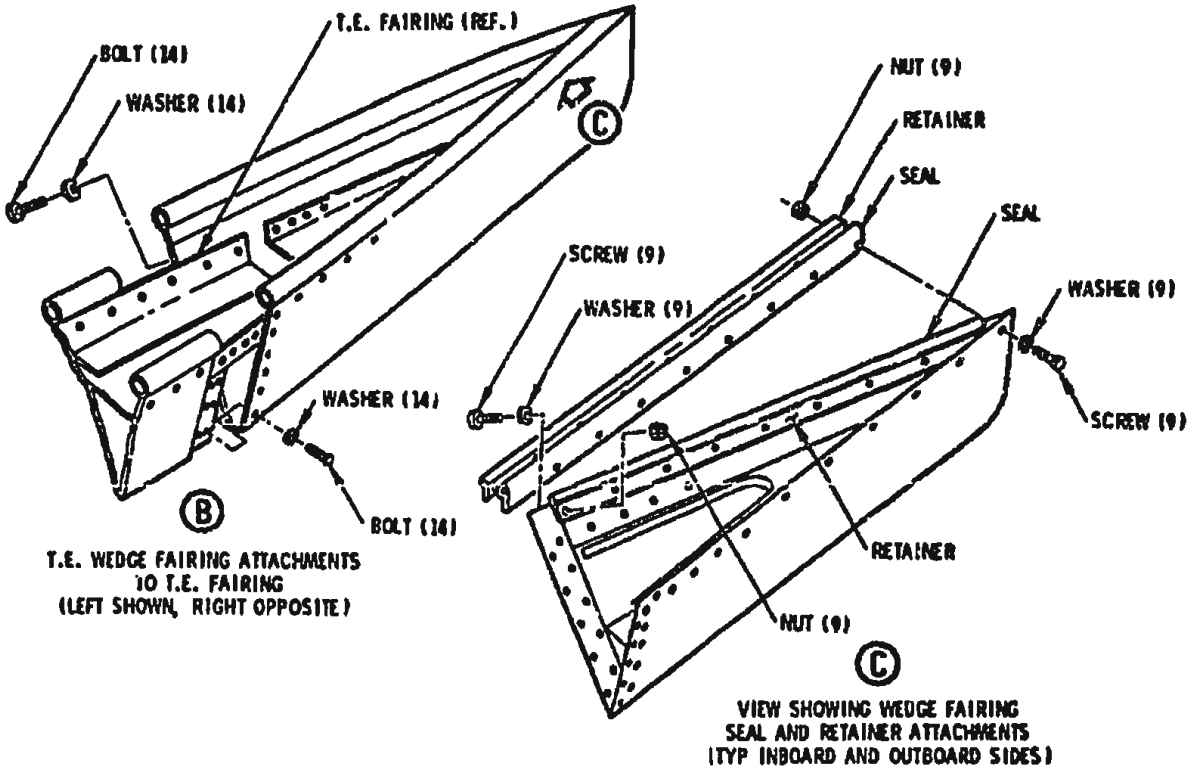
R (2) With wedge fairing in approximate position, move
R forward as required to align bolt attachment holes.

R (3) Install 14 bolts loosely on inboard and outboard sides.

R (4) Tighten bolts evenly from side-to-side, until all bolts
R are tightened.

R (5) Verify that seals are in contact with wing skin.





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R Trailing Edge Wedge Fairing - Removal and Installation
R Figure 401

R EFFECTIVITY: ALL
R
R
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CENTER ENGINE FAIRINGS - REMOVAL AND INSTALLATION

1. General

This removal and installation procedure is applicable for the side panels of the aft fairing and the lower fairing of the center engine structure.

R Removal and installation of the center engine glove fairing is detailed in ATA 54-52-53.

2. Removal/Installation

A. Removal

(1) Remove screws and washers.

(2) Remove and stow panels as required.

B. Installation

(1) Check panels for condition of core, fiber glass laminates, and holes.

(2) Position and support panels, and install screws.

R CENTER ENGINE GLOVE FAIRING - REMOVAL AND INSTALLATION

R 1. General

R This procedure provides information for the removal and
R installation of the glove fairing, located below the center
R engine support structure in zone 470.

R 2. Equipment and Materials

R Low Range Milliohmmeter, Shallcross No. 670A, or equivalent

R 3. Removal/Installation

R A. Removal

R (1) Remove tri-wing screws and remove glove fairing access
R doors 438AL, and 438AR if required.

R (2) Remove quick-release pin, connecting drag link to
R engine nacelle fitting, at PPS (power-plant station)
R 209.00.

R (3) Remove electrical bonding jumper attachment bolts from
R engine nacelle fittings at PPS 204.00 (approx).

R (4) Remove glove fairing assembly by sliding unit straight
R aft.

R NOTE: If glove fairing does not readily move aft,
R apply simultaneous pressure (in aft direction)
R on inboard and outboard side of glove fairing at
R access door opening. Also, check that loose
R bonding jumpers are clear of holes in glove
R fairing upper web as fairing is moved away from
R aircraft.

R B. Installation

R (1) Check glove fairing forward and aft upper pressure
R plate assemblies for proper installation and alignment,
R as follows:

R (a) Tapered ends of upper pressure plate assemblies
R must be aligned in forward direction.

R (b) Tighten forward and aft glove fairing hanger
R assembly bolts and nuts until springs are
R compressed to length of 0.50 (±0.03) in.

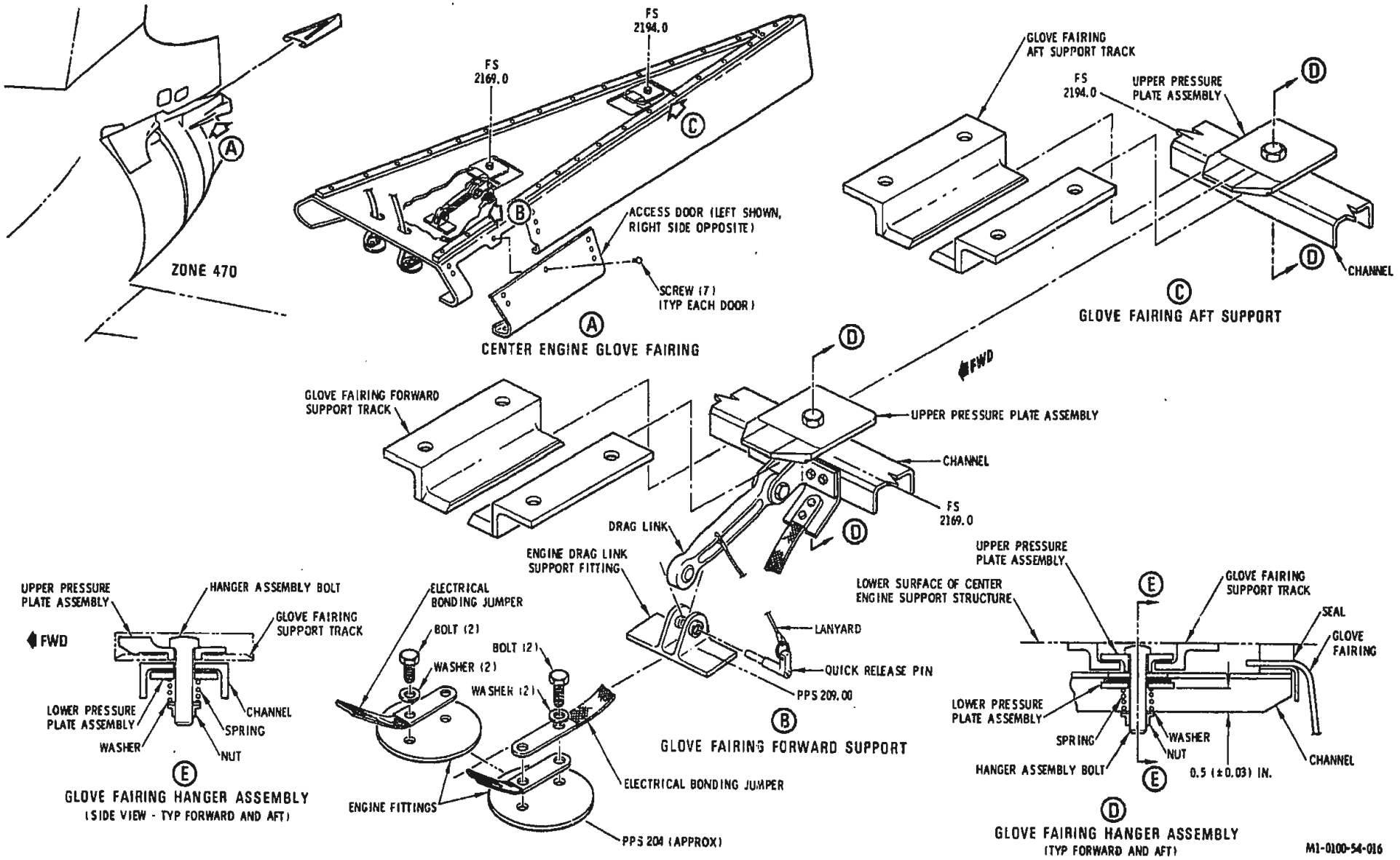
R (2) Move glove fairing forward into position below the
R center engine support structure, while forward and aft
R glove fairing upper pressure plate assemblies are
R aligned to mate with forward and aft glove fairing
R support tracks.

R (3) Align glove fairing drag link with nacelle drag link
R fitting at PPS 209.00, and install quick-release pin.

R (4) Clean bonding jumper terminal and engine fitting
R interface surface at PPS 204.00 (approx.), and attach
R bonding jumper terminal with bolts and washers.

R (5) Check for bonding joint resistance of 0.01 ohm dc
R maximum.

R (6) Install glove fairing access doors.



R Center Engine Glove Fairing - Removal and Installation
R Figure 401

R EFFECTIVITY: ALL

001B

COLD STREAM REVERSER INTERFACE FAIRINGS SKIN DESCRIPTION AND OPERATION

1. General

The translating and non-translating fairing skins are made from aluminum alloy, electro-chemical machined to various thicknesses.

The skin of the translating fairing for fuselage mounted engine (No. 2 position) is secured by rivets to stiffeners and rubbing strips.

The skin of the translating fairing for the wing mounted engine (No. 1 and 3) position is secured by rivets to rubbing strips.

The skins of the non-translating fairings are secured by rivets to angles.